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of the American Society of Hospital Pharmacists

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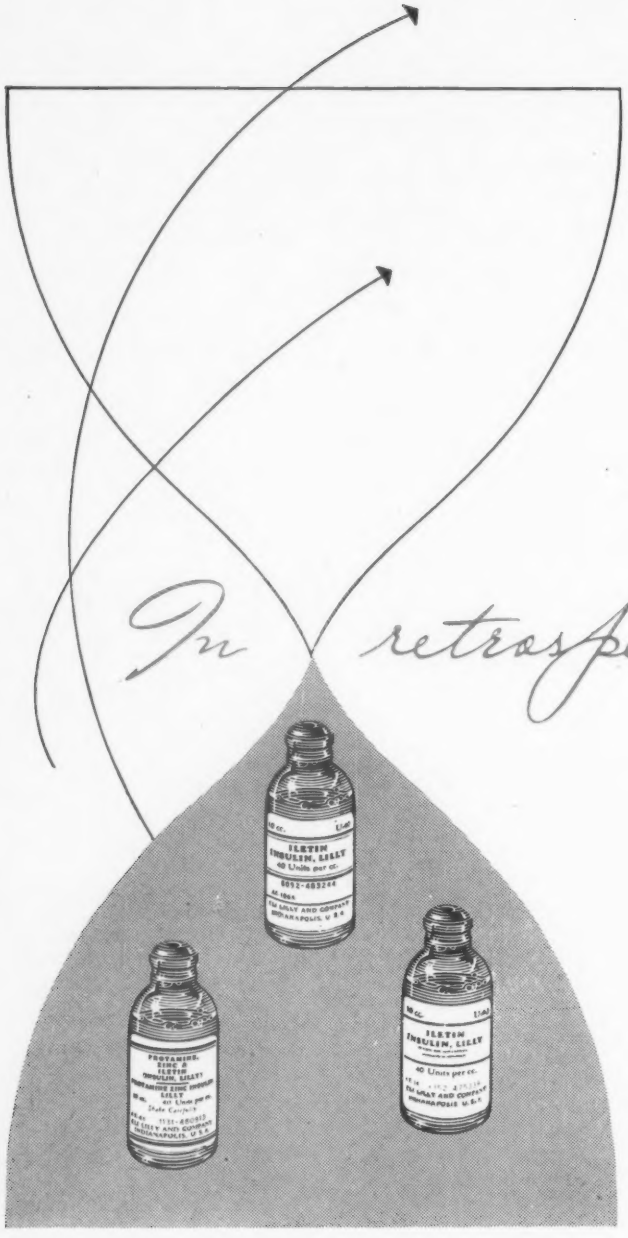

In retrospect

Medical history chronicles few more dramatic achievements than the discovery and subsequent development of Insulin. In May, 1922, the Insulin Committee of the University of Toronto accorded to the Lilly Research Laboratories the privilege of co-operating with the original investigators in the development of a process for the large-scale manufacture of a highly purified, stable, uniform preparation of Insulin.

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MARCH-APRIL 1950
VOLUME 7 NUMBER 2

The BULLETIN
American Society of Hospital Pharmacists

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SUBSCRIPTION RATE: In the U.S. $4.50 per year (six issues), single copies 75 cents; Foreign $5 per year, single copies 85 cents.

CHANGES OF ADDRESS should be directed to the Division of Hospital Pharmacy, American Pharmaceutical Association, 2215 Constitution Ave. N.W., Washington 7, D.C.

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The American Society of Hospital Pharmacists, an affiliate of the American Pharmaceutical Association, is a national organization devoted to the profession of hospital pharmacy and dedicated to the interests of the hospital pharmacist.

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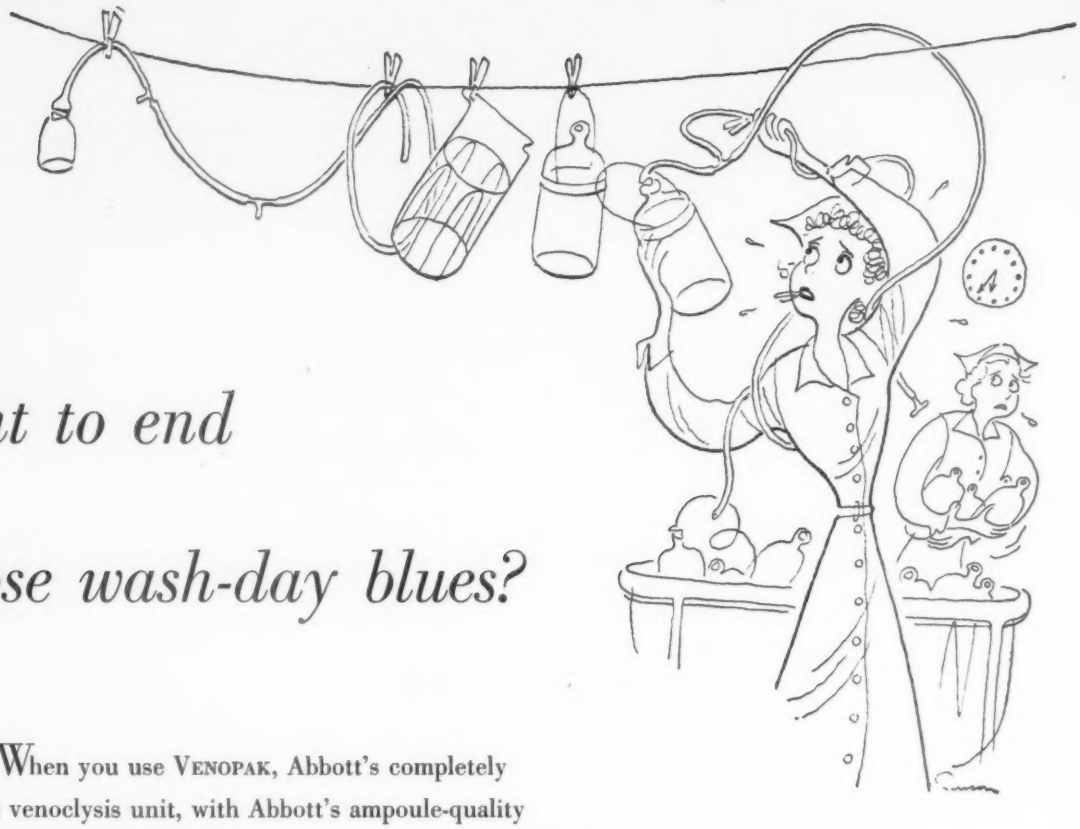
THE BULLETIN is published bimonthly at 1313 Ann St., Ann Arbor, Mich., by the American Society of Hospital Pharmacists in cooperation with the Division of Hospital Pharmacy of the American Pharmaceutical Association. Application for entry as second-class matter is pending. CONTRIBUTIONS of articles will be accepted if they are of general interest to those in hospital pharmacy. The editors reserve the right to revise all material submitted, if necessary. The American Society of Hospital Pharmacists and the American Pharmaceutical Association assume no responsibility for the statements and opinions advanced by contributors to THE BULLETIN. Views expressed in the editorials are those of the editor and do not necessarily represent the official position of either the American Society of Hospital Pharmacists or the American Pharmaceutical Association.



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LETTERS

Congratulations

SIRS: I have just finished reading the January-February issue of THE BULLETIN OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS and I want to extend my congratulations to you and your staff for the excellent "face-lifting" job that you have done.

Hospital pharmacy is undergoing the most rapid growth phase in its history and it is very proper that the journalistic efforts of the Society likewise show proportionate growth. . . . I hope that you and your staff find renewed stimulation for THE BULLETIN and that you will pursue its activities with renewed diligence.

DONALD C. BRODIE

College of Pharmacy
The Medical Center
San Francisco 22, California

SIRS: I have just received the January-February 1950 issue of THE BULLETIN OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. You are to be congratulated on this publication. I think your departmental plan is excellent and I know every member must feel as I do; there is no publication in the field to compare with THE BULLETIN.

C. L. BUSICK

St. Joseph's Home and Hospital
Stockton, Calif.

SIRS: We surely like and enjoy the "new look" of THE BULLETIN! It is a publication to be very proud of and a great help to hospital pharmacists.

DOROTHY E. TOBIN

Foote Memorial Hospital
Jackson, Mich.

SIRS: CONGRATULATIONS ON NEW LOOK OF BULLETIN.

NORMAN HAMMELMAN

V. A. Hospital
Jefferson Barracks, Mo.

SIRS: I have just received and thoroughly enjoyed reading my copy of the new BULLETIN OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. I must say that I was quite pleased with its appearance and composition. You certainly have done a fine job in developing it into an outstanding journal.

D. O. MCCLUSKY, JR., *Administrator*
Druid City Hospital
Tuscaloosa, Ala.

Enjoys Bulletin

SIRS: I received the May-June 1949 issue but since then, no BULLETIN. Can you send me the numbers I have missed?

I am really looking forward to several copies of THE BULLETIN arriving at the same time for I generally find single issues too short. It's swell! Thanks very much.

EDITH E. HILL, *Chief Pharmacist*
The New England Baptist Hospital
Boston, Mass.

Source of Rubber Stoppers

SIRS: We have had inquiries from time to time for the source of supply of rubber stoppers of various sizes for hypodermic puncture.

These rubber stoppers, as well as serum vials, Seitz Filters, various sizes, etc., can be purchased at a very reasonable cost from the National Surgical Supply Company, 458 Broadway, New York 13, N.Y.

I thought this information would benefit many other pharmacists.

SISTER M. JEANETTE, O. P., *Chief Pharmacist*
Mary Immaculate Hospital
Jamaica, New York

New Affiliates

SIRS: As secretary of the Texas Society of Hospital Pharmacists, I hereby apply for affiliation of our state society with the American Society of Hospital Pharmacists.

A copy of the minutes of our organization meeting, a copy of our constitution and by-laws, a list of our membership to date, and a report of our activities since our organization meeting are hereby enclosed.

We shall all look forward to seeing our society become a chapter of the national organization and hope that it will be our privilege to contribute generously to the growth and the activities of the national society.

ADELA SCHNEIDER, *Secretary*
Texas Society of Hospital Pharmacists
Southern Pacific Hospital
Houston, Texas

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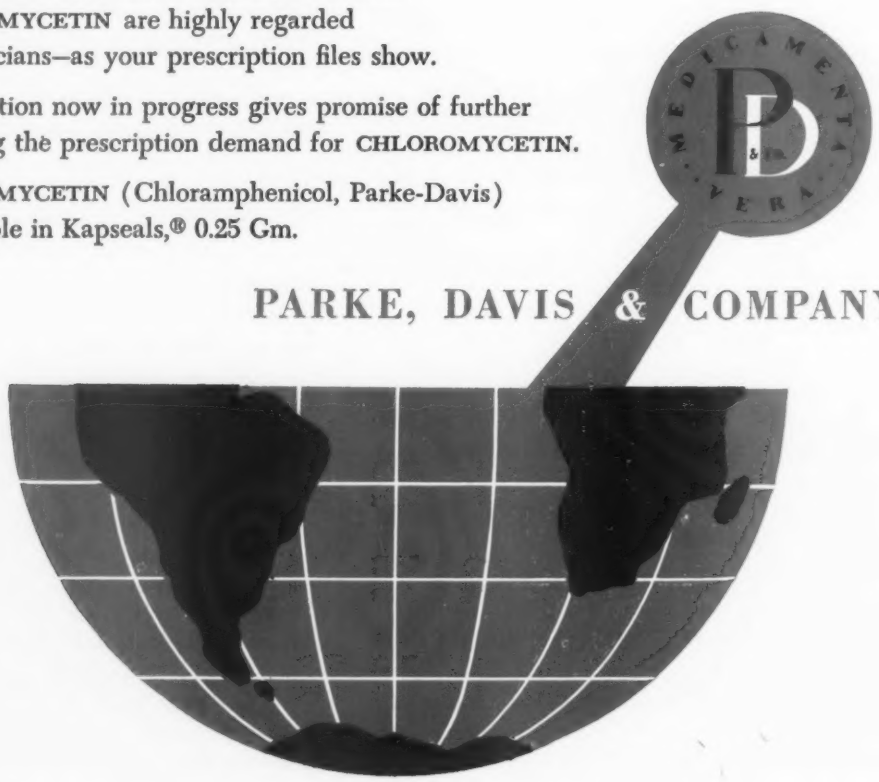


EDITORIAL

The Importance of Standards for Hospital Pharmacy Internships

by Don E. Francke

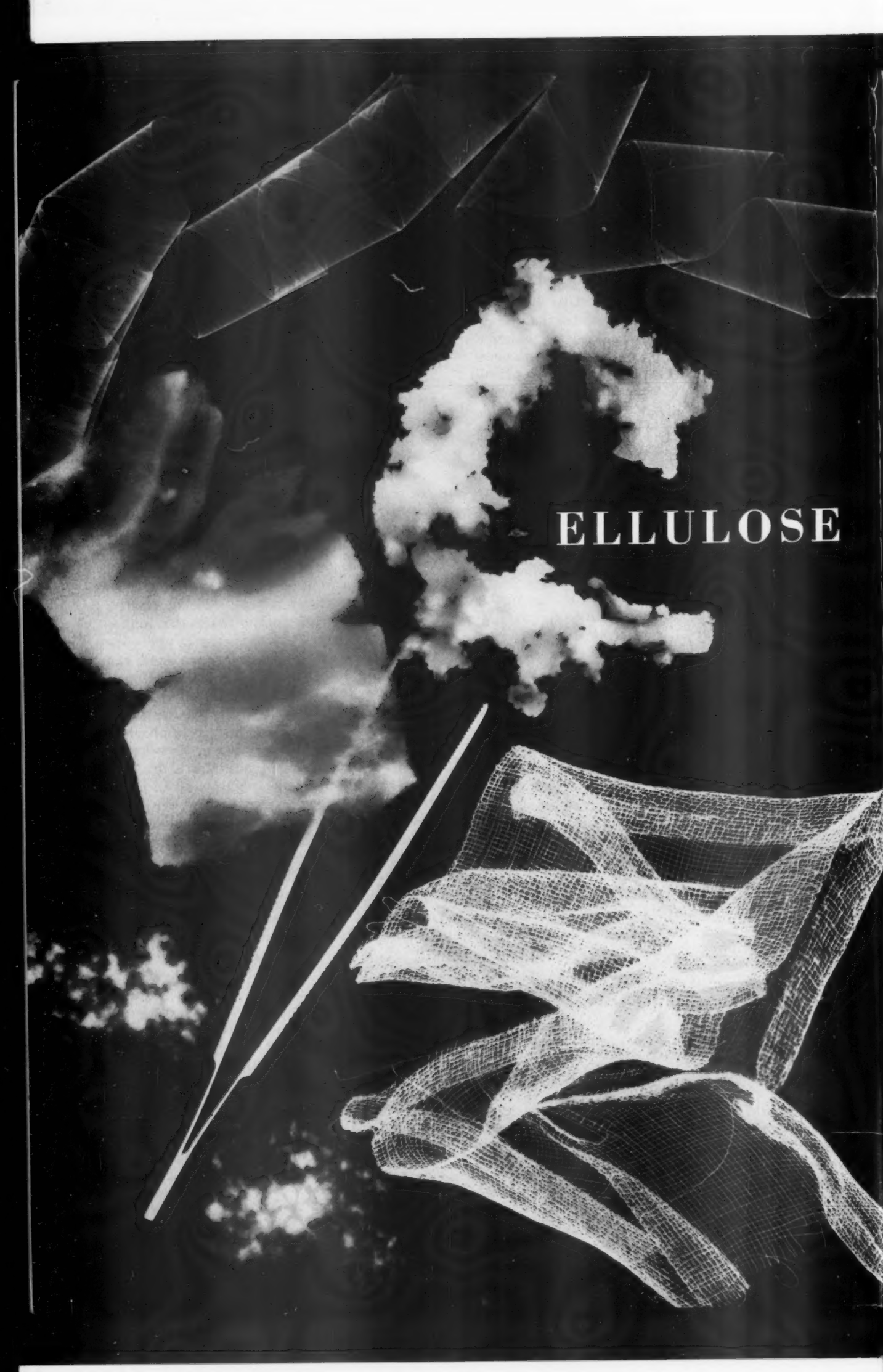
AN INTERNSHIP may be broadly defined as a period of specialized professional training. Hospital pharmacy internships are of relatively recent origin and those being offered today may be divided into two classifications, each of which is unquestionably highly important. The non-academic internship is, as the name implies, a period of training in hospital pharmacy without formal courses given for academic credit. The academic internship involves formal college courses leading to an advanced degree given concurrently with specialized hospital pharmacy training.

TODAY, AS NEVER BEFORE, the proper development of these intern programs is of the highest importance. They are important to the future, to the success, and to the advancement of hospital pharmacy. The potentialities of hospital pharmacy have, as yet, scarcely been touched. More and more students are now realizing that in the specialty of hospital pharmacy they will have the opportunity to practice their profession *per se* without the encumbrances so evident in other outlets for those trained in pharmacy. They have noticed also that the wage scale in hospital pharmacies is steadily increasing for those well trained people who can do a superior job.

BUT IN GENERAL, pharmacy students in our colleges still have little insight or knowledge of the possibilities in the field of pharmacy practice in hospitals. This situation is being corrected slowly. In the meantime, hospital pharmacy internships must be developed to a point whereby the training presented will be so organized that each intern will receive certain knowledge and experience which is considered fundamental. The recent graduate in pharmacy, no more than the recent graduate in medicine, cannot be considered a finished product. He has only a broad general background in a highly specialized field. Training and experience are necessary before he can successfully practice his specialty. To provide the proper training and experience it is essential that standards be developed which will assure to each trainee the requisite practice and knowledge he should have for a career in hospital pharmacy. Basic standards below which no training program should fall are essential in fairness to those students who choose hospital pharmacy as a career. But on the other hand, in the establishment of standards for pharmacy internships, the development of stereotyped programs should be avoided. Rather, individual initiative and creative ability should be fostered and encouraged so as to allow the total concept of internships to progress to the highest possible level.

IF ONE MAY VENTURE to select the most important part of the pharmacy intern's training and the aspect which is probably most often neglected, it is probable that what we think of as "Hospital Pharmacy Administration and Policy" would fall into this category. When a pharmacist accepts a position as the head of a Pharmacy Department, the administrator takes for granted that he has all the technical knowledge and skill required to supply the desired or needed pharmacy service. It is true that the administrator often does not know the type or amount of pharmacy service which should be given, but still he expects a graduate pharmacist to be so trained as to be able to perform all the service required. He must, to a great extent, leave the question as to the quality and extent of service up to the integrity and initiative of the pharmacist. On the other hand, the administrator does have a very well developed idea of what he expects of the pharmacist as a department head, and it is in this particular aspect of his job where, far too often, the pharmacist is without adequate training or knowledge. It is the more important because this is the field in which the administrator is better able to judge his performance since he must assume the pharmacist's knowledge and training in the technical aspects of pharmacy. The pharmacist may have superior training in pharmacy and still utterly fail in the administration of his department and thus do an inferior job as chief pharmacist.

THUS INTERNSHIPS are important for the training of potential department heads whose responsibility it is to provide service to the hospital, the patient, the medical staff, and to the other units, comprising the institution. Through these training programs the pharmacist must receive guidance and knowledge in matters concerning administration and policy if he is to successfully carry out his function as a department head. The attitude and thinking of a department head must be fostered in each intern, he must be encouraged to develop the initiative required for the development and expansion of his department and he must learn to deal with situations and people, singly and in groups, in such a manner as to evoke cooperation.


ELLULOSE

The unusual properties of

cellulose derivatives

are of great value

in pharmaceutical formulations

By EDITH BACTOWSKY AND JOSEPH PRESTO

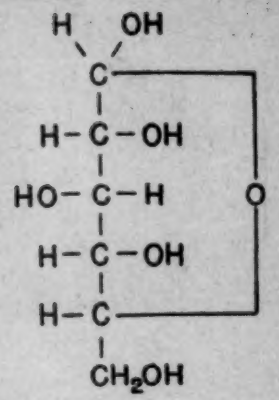
PREPARATIONS

in Pharmacy and Medicine

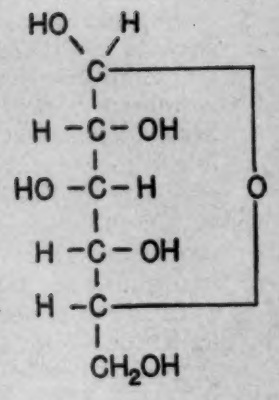
ONE of the most abundant carbohydrates present in nature is cellulose. This polysaccharide is the chief constituent of plant cell walls. Cotton contains the most cellulose—90 per cent, with wood and cereals containing 60 per cent, and straw 30 to 40 per cent.[1] Due to its colloidal characteristics and fibrous structure, it has the properties of absorption, swelling, dissolution, and coagulation.[1] The processes of isolating cellulose from its various sources, are essentially the same. The non-cellulose substances are removed and cellulose is obtained as hair from cotton, bast from flax, and fibers from wood. The purest form is obtained from cotton.[2] Cellulose is characterized by its *beta-d*-glucose linkage and is composed of 100 to 2000 glucose units in its chain which is either single or bundles of parallel chains.

The arrangement of glucose, as illustrated by either the amylene oxide or glucopyranose structures, may be seen to differ only in the stereochemical arrangement of the *alpha* and *beta* forms. Cellulose differs from starch in that the starch molecule has an *alpha-d*-glucose linkage and has a branched chain structure.

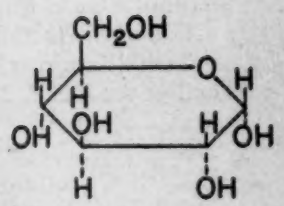
Cellulose is resistant to hydrolysis, but with heat and acids it can be converted quantitatively to glucose. In



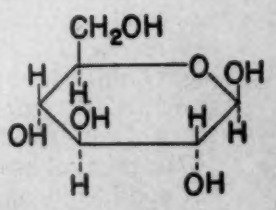
Alpha-d-glucose



Beta-d-glucose

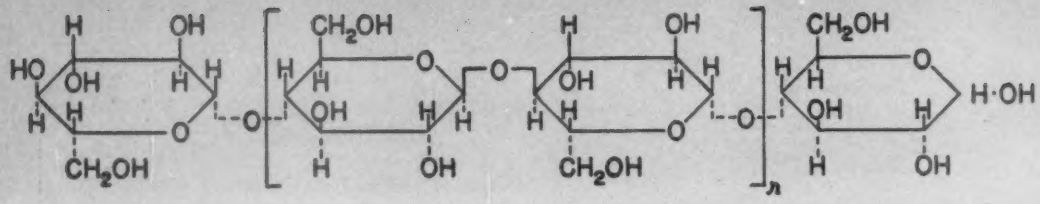


Alpha-d-glucopyranose



Beta-d-glucopyranose

EDITH BACTOWSKY and JOSEPH PRESTO are senior and junior pharmacy interns respectively, at Philadelphia College of Pharmacy and Science and Jefferson Medical College Hospital, Philadelphia.



COMPARISON OF cellulose molecule with its *beta-d*-glucose linkage (above) and the starch molecule (right) which has the *alpha-d*-glucose linkage and branched chain structure.

ordinary solvents it is insoluble, but can be dissolved by certain chemicals.[4] Unlike other polysaccharides, it passes through the human digestive system without being affected by digestive enzymes and therefore, provides no food energy. Its therapeutic function is one of providing bulk and thereby preventing constipation.[3] Certain herbivorous animals can utilize cellulose directly due to the presence of cellulose-splitting enzymes or symbiotic micro-organisms such as protozoa, yeast, and bacteria that are present in the alimentary tract. These symbionts break down cellulose into lower fatty acids and the host is able to utilize these for carbohydrate, fat, and tissue formation.[5,6]

OFFICIAL PRODUCTS

Purified cotton was the first cellulose product recognized, being official in the U.S.P. IV of 1860. Collodion was introduced into the U.S.P. V of 1870. This product contains 5 per cent Pyroxylin (Soluble Guncotton) which is obtained by the action of nitric and sulfuric acids on cotton. Various modifications of these products are still official in the U.S.P. XIV and N.F. IX namely; Purified Cotton U.S.P., Absorbent Gauze U.S.P., Sterile Absorbent Gauze U.S.P., Gauze Bandage U.S.P., Collodion U.S.P., Flexible Collodion U.S.P., Oxidized Cellulose U.S.P., and Methylcellulose N.F.

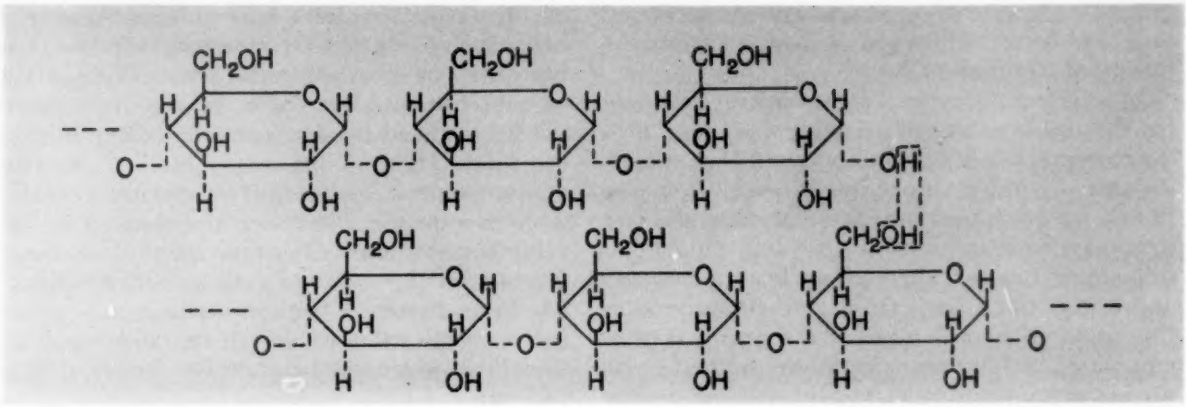
OXIDIZED CELLULOSE U.S.P. XIV

The intermediate substance in the production of oxidized cellulose was first produced in 1883 and was later named oxycellulose.[7] A comprehensive review of the numerous methods of oxidizing cellulose was compiled in 1922.[7] This led to a more detailed investigation of the physical properties of cotton cellulose.[8]

The medical aspects of oxidized cellulose were not considered until 1942 when Frantz first investigated its hemostatic properties in laboratory animals.[9] The oxidized cellulose used was developed by the Eastman Kodak Company.[10] Cotton was treated with nitrogen dioxide in a closed chamber, washed with distilled water, and air dried.[11,12] There was no shrinkage in the cotton when the oxidation was controlled so that the product contained no more than 15 per cent –COOH groups. This produced a cellulose product that was fluffy, white, and could not be distinguished from its precursor. It did not break upon handling. If more than 15 per cent –COOH groups were present, the product became hardened, shrunk, and was not uniform. This method of oxidation was of a topochemical nature, therefore, the resulting product was not uniform. An improved method was devised whereby, the cellulose fibers were oxidized by nitrogen dioxide before, rather than after, spinning and weaving.[13] The threads were thus oxidized uniformly throughout so that when used in surgical dressings, there was complete absorption at the site of application.

The applications of oxidized cellulose are numerous and its use is routine in surgery where it has been applied in every situation, be it external or internal, where a hemostatic agent is required.

Oxidized cellulose exerts an unusual hemostatic effect and possesses the property of being absorbed when buried in tissues. Its hemostatic action is dependent upon the formation of an artificial clot by the oxidized cellulose which has a marked affinity for hemoglobin, but does not enter *per se* into the physiological clotting mechanism. Absorbability depends on the size of the implant used, the adequacy of the blood supply to the area, and the degree of chemical degradation of the material. Absorption of the oxidized cellulose ordinarily occurs between the second and seventh day following implantation of the dry material, but complete absorption of large amounts of blood-soaked material may take six weeks or longer.[14]



The hemostatic action of oxidized cellulose is not enhanced by the addition of other hemostatic agents, which would probably be destroyed by the low *p*H of the material. When using oxidized cellulose with thrombin, it must first be neutralized with sodium bicarbonate in order to be effective.[15] The hemostatic effect is greater when the dry material is applied, so that moistening with water or saline is not recommended. Oxidized cellulose should not be used as a surface dressing over a period of time as it inhibits epithelialization. When oxidized cellulose is applied to a site of bleeding, it forms a brown gelatinous mass that is gradually absorbed. No adhesions are formed and it is non-toxic. Absorption is due to phagocytosis.[16] It has been reported that it inactivates penicillin and delays bone repair.[17] The product should never be resterilized or heated, as sterilization must be carried out by chemical methods.

Oxidized cellulose is available commercially as Hemo-Pak from Johnson and Johnson, and Oxycel, cotton or gauze type, from Parke, Davis and Company.

CARBOXYMETHYLCELLULOSE (C.M.C.)

Carboxymethylcellulose was first developed by Jansen in Germany in 1918, where it is known as sodium cellulose glycolate.[18] It is made by first swelling purified cellulose with aqueous sodium hydroxide solution. The alkali cellulose is then reacted with sodium monochloracetate to form sodium carboxymethylcellulose and salt. The material is purified by washing out the salt with alcohol. Sodium carboxymethylcellulose, commonly called cellulose gum, is available as Hercules CMC from the Hercules Powder Company of Wilmington, Del.

There are four viscosity types of carboxymethylcellulose—low, medium, high, and extra-high. The high viscosity type is generally used as a thickening agent and the low viscosity as an adhesive or binding agent.[19,20] The medium viscosity type is used for various applications, initial experiments generally being necessary to determine the viscosity required for a specific application. Carboxymethylcellulose is soluble in water, water-alcohol solutions, and water-acetone solutions. In water-alcohol solutions there must be at least 50 per cent water. In water-acetone solutions there must be at least 60 per cent water to maintain the solubility of C.M.C. The greatest amount of alcohol can be used with low viscosity C.M.C. before any precipitation or hazing results. Changes in temperature affect the viscosity of C.M.C.

Several methods may be used in making aqueous solutions. By simple and efficient stirring of the water while the powder is added slowly, a clear and smooth solution is effected more rapidly. An alternate technic is to wet the C.M.C. with glycerin or alcohol and add the water rapidly with good agitation. By using a homogenizer a uniform solution results.

Many types of naturally occurring colloids have been used as laxatives. Their use has been unfavorable because they have either caused allergenic responses, interfered with digestion and absorption, caused further constipation and irritation, or may have been altered in the gastrointestinal tract.[21]

A collodial laxative to be effective, must have a high degree of miscibility in order that the intestinal contents are soft throughout the entire tract. The gel must retain water against the pull of osmotic forces within the intestinal wall. Carboxymethylcellulose is favored as a laxative since it is nontoxic, produces no roughage, has lubricating properties, does not interfere with normal metabolism of foods and vitamins, and does not cause intestinal impaction.[22,23] In laboratory experiments test animals grew more rapidly and a

greater body weight was attained due to increased bulk and better utilization of food, by improved intestinal elimination.[24]

In cases of diarrhea, carboxymethylcellulose has the ability to absorb irritating toxins and produce normal stools. It is an undigestible gel which prevents excessive absorption of water from the bowel. An advantage over mineral oil, is the fact that oil-soluble irritants are not left clinging to inflammed mucosa, there is no fear of leakage, and it does not absorb fat-soluble vitamins from the intestinal tract. No gastric discomfort is present when carboxymethylcellulose is used.[25] Its use is contraindicated in any constricting lesions of the bowel.[22]

Sodium carboxymethylcellulose is available in a pharmaceutical preparation as Carmethose from Ciba Pharmaceutical Products, Inc. The tablets contain 225 mg. of sodium carboxymethylcellulose and 75 mg. of magnesium oxide per tablet. A liquid preparation is available in 5 per cent concentration. Carcel tablets from the Canada Pharmaceutical Company, Ltd. contains in each tablet 0.5 gram of sodium carboxymethylcellulose and 0.3 mg. of thiamine hydrochloride.

Sodium carboxymethylcellulose has been used as a vehicle for an antiseptic substance in treating vaginal infections. Five grams of C.M.C. was used with no evidence of irritation.[23] One-half to 1 per cent sodium carboxymethylcellulose is useful as a stabilizer for emulsions of castor oil, paraffin, linseed oil, sodium stearate, and sodium oleate.[19] The following formula has been proposed for a citrus oil emulsion that can be used as a vehicle.[26]

CITRUS OIL EMULSION

Citrus Oil	5.0 cc.
Water Phase	95.0 cc.

The water phase is composed of the following:

Carboxymethylcellulose, low	3.0 Gm.
Carboxymethylcellulose, medium	1.0 Gm.
Water, to make	100.0 cc.

A sufficient quantity of preservative and water-soluble dye is added to the water phase. Dissolve the C.M.C. in water at 140-160 degrees F. by vigorous agitation. When cool, add the citrus oil and a coarse emulsion is formed. Homogenize the resulting mixture. The oil phase may be modified but the ratio of the low and medium viscosity C.M.C. should be maintained and its concentration should be about 4 per cent of the aqueous phase.

The ease with which C.M.C. is dispersed makes it valuable in ointment bases. In the treatment of chronic surface ulcers, a gel with red blood cells has been made.[27] Carboxymethylcellulose has been used in controlling the action of digitoxin wherein the solubility characteristics of digitoxin can be modified by incorporating this colloid in the formulation of digitoxin tablets.[27] The rate of absorption of digitoxin is slower and a continuous therapeutic effect is maintained. The development of liquid absorbing surgical dressings saturated with water and carboxymethylcellulose has been reported. Carboxymethylcellulose has found application in dentifrices and hand lotions.[18] A suggested hand lotion formula is as follows:

HAND LOTION

Glycerin	570.0	cc.
Alcohol	570.0	cc.
Carboxymethylcellulose, low	38.0	Gm.
Amaranth Solution, U.S.P.	1.0	cc.
Coumarin	0.04	Gm.
Benzalkonium Chloride Solution, U.S.P. (10%)	4.0	cc.
Distilled Water, to make	3800.0	cc.

Heat 2655 cc. of distilled water to boiling and add the carboxymethylcellulose. Dissolve the coumarin in alcohol, add to glycerin, benzalkonium chloride, and amaranth solution. Combine the two solutions and mix.

METHYLCELLULOSE N.F. IX

The best known and longest used of the cellulose ethers is methylcellulose. The usual method of preparation is by reacting highly purified cotton or wood cellulose with sodium hydroxide, to form alkali cellulose and the latter is reacted at elevated temperatures with methyl chloride.[28] Temperature control is important to avoid cellulose destruction or degradation. The degree of esterification determines the properties of the final products. Methylcellulose is regularly produced in several viscosity types to meet a wide range of application requirements. It is available in this country as Methocel from the Dow Chemical Company of Midland, Michigan in seven viscosity types: 10, 15, 25, 100, 400, 1500 and 4000 centipoises. It is obtainable as Colloresin from the Aromatics Division of General Drug Company, 170 Varick St., New York City, in seven viscosity types. In Europe it is known as Tylose.

Methocel is a white powder or fiber, and is odorless, tasteless, and non-toxic.[28] It is insoluble in hot water, in most saturated salt solutions, and in organic solvents, but is soluble in cold water. Oil or greasy materials of mineral, animal or vegetable origin do not affect it. Methocel is stable to

alkalies and dilute acids. Aqueous solutions can be diluted with any proportion of alcohol without precipitation. Neutral solutions can be obtained over a wide range of viscosity and may vary in consistency, from that of water to thick pastes.

It is a hydrophilic colloid and dissolves by successive hydration of the fiber layers. Solutions of powdered methylcellulose can be prepared most readily by first mixing the material thoroughly with one-fifth to one-third of the required weight of water at 80-90 degrees C. and allowing it to soak for 20 to 30 minutes. In the case of fibrous methylcellulose, it may be necessary to use as much as one-half the required amount of water at 80-90 degrees C. The remainder of the water may then be added, either as cold water or as ice. The mixture is then cooled to room temperature and stirred until smooth. Further cooling to within 5-10 degrees C. will yield solutions of maximum clarity.

Due to its colloidal properties the outside of the methylcellulose particles will swell first and the water required for solution of the interior of the particle, must diffuse through the gelatinous membrane. Use of hot water insures wetting of all portions of the fiber prior to dispersion, since it is insoluble in hot water and hot water can readily penetrate the fibers.

Methylcellulose differs from other hydrophilic colloids in that the solutions gel on heating, while others, gel on cooling. As the temperature increases, the viscosity of a solution decreases until the gel point is attained. Prior to gelation, hazing of the solution will occur and the viscosity may start to rise. The methylcellulose in solution precipitates at this point and forms a gel, if the concentration is high enough. The gel point of a methylcellulose solution depends upon the viscosity type, its concentration and presence of any dissolved salts. Solutions of high viscosity types will gel at lower temperatures than those of the lower viscosity types at the same concentration.

The gelation behavior of methylcellulose lies in its manner of solution. In solution it exists as aggregates of long threadlike molecules, surrounded by successive layers of water molecules which add to the bulk of the aggregate. As the temperature increases, the energy of these more or less loosely bound water molecules, increases and those of the outer layers break away, resulting in a decrease of viscosity. When enough of the attached water molecules have been removed, the methylcellulose is no longer soluble and the solution is transformed into a gel. This gelation phenomenon is reversible upon cooling.

The presence of soluble salts in methylcellulose solutions, decrease the temperature of gelation by decreasing the amount of hydration of the methylcellulose molecules.

Laboratory experiments show that animals maintain health on diets containing large quantities of methylcellulose. If the diet of the animals was low or normal in roughage, 96.8 per cent was excreted unaltered according to laboratory assay.[29,30,31]

Since its properties are similar to carboxymethylcellulose, methylcellulose has been used as a laxative. One-half gram tablets in 30 cc. of lukewarm water dissolve in 5 to 10 minutes forming a colloidal solution.[32] It passes through the gastrointestinal tract unchanged in a liquid state and bulk does not form until it reaches the lower part of the ileum and colon. Two tablets daily have been found to maintain normal bowel function.

Methylcellulose is available commercially in tablet form as Cellothyl tablets 0.5 Gm. from the Chilcott Laboratories, Division of Maltine Co., Morris Plains, New Jersey. Prulose tablets, a product of the Harrower Laboratories, Inc., Glendale, California, contain 0.3 Gm. of dehydrated prune concentrate and 0.5 Gm. of methylcellulose in each tablet.

Methylcellulose is used pharmaceutically as a binding, thickening, dispersing, emulsion-stabilizing, and film-forming agent. It is an excellent replacement for the natural gums, having the advantage of being uniform, completely soluble in water and containing no dirt or foreign material.

Since methylcellulose lowers the surface tension of water, it can be used in stabilizing emulsions. It is not a very effective emulsifying agent, but when used in conjunction with a good wetting agent it will aid in stabilizing the resulting emulsion.[28] Emulsions of the oil-in-water type are produced which are noteworthy for their fine appearance and stability.

It has proven useful in a great variety of toilet and therapeutic preparations including deodorants, depilatory pastes, lotions, hand and face creams, protective ointments, burn films, and even blood substitutes.

The suspending properties of methylcellulose have been investigated as an additive to synthetic detergents to improve their soil suspending power.[28] This property has been used advantageously in dermatologic lotions, as the following formula: [33]

SULFUR LOTION

Precipitated Sulfur	10.0 Gm.
Camphor Spirit	10.0 cc.
Alcohol	80.0 cc.
Methylcellulose, high	0.6 Gm.
Rose Water, to make	240.0 cc.

This formula provides a lotion with a smooth, creamy appearance with activity of the sulfur increased, and remaining closely adherent to the skin instead of flaking off as in other methods of suspension. A low proportion of a high viscosity methylcellulose is best employed for the preparation of fluid emulsions.

Methylcellulose has been recommended as an additive to soap, since the texture and lathering properties have been improved.[28] It can be used to extend soap and the following formula has been developed for extending liquid scrub soap:

SCRUB SOAP

Methocel, 4000 cps.	0.4 Gm.
Water	44.5 cc.
*Tamol NNO	0.1 Gm.
*Triton X – 300	5.0 Gm.
Scrub Soap (18 – 20 per cent soap)	50.0 cc.

* Wetting agents manufactured by Rohm and Haas Chemical Company, Philadelphia, Pa.

This mixture provides clear solutions with better viscosity than standard scrub soaps.

It has been found that the most suitable concentration of methylcellulose, low viscosity (15 cps.), lies between 15 and 20 per cent. Extra high viscosity (1500 cps.), methylcellulose can be used in concentrations from 10 to 15 per cent to produce bases of ointment consistency.[34]

Sizings of methylcellulose of 1 to 3 per cent using 15 to 100 centipoise viscosity type are effective in resisting penetration of gloss ink, varnishes, lacquers, and waxes, and furnish a greaseproof coating to paper.[28]

The film forming properties of methylcellulose has been used effectively in the production of composite preformed therapeutic films suitable for application to moist lesions, burns, and other wounds.[35] The transparent coating permits observation of the damaged tissues. The following formula illustrates this use:

SULFADIAZINE FILM

Methylcellulose (15 cps.)	50.0 Gm.
Sulfadiazine	25.0 Gm.
Glycerin	20.0 Gm.
Propylene Glycol	20.0 Gm.
*Polyethylene Glycol 4000, U.S.P. XIV	10.0 Gm.
Distilled Water, to make	750.0 cc.

Suspend the methylcellulose in 500 cc. of boiling water and freeze overnight. Add the sulfadiazine, glycerin, propylene glycol, and Carbowax in enough water to make 250 cc. and freeze overnight. Defrost and mix the two solutions, strain through gauze and using a pressure spray-gun, spray onto a glass surface. A film will be formed in less than one hour under an infra-red lamp. The film can be sterilized in waterproof cellophane.[35]

* Polyethylene Glycol 4000 is available as Carbowax 4000 from the Carbide and Carbon Chemicals Corp., New York 17, N.Y.

Methylcellulose has been recommended for a cod liver oil emulsion as illustrated by the following formula: [37]

COD LIVER OIL EMULSION

Cod Liver Oil	50.0 cc.
Methylcellulose (400 cps.)	1.0 Gm.
Glycerin	1.0 cc.
Benzaldehyde	0.2 cc.
Saccharin Solution	1.0 cc.
Water, to make	100.0 cc.

Capsules of methylcellulose have been manufactured, and it has been a valuable binding agent for aspirin tablets, where a 1 per cent concentration of 1500 cps. methylcellulose is used.[4,34]

Methylcellulose is of value as a binder in toothpastes.[36] The following formula depicts its use in dentifrices: [28]

TOOTHPASTE

Methylcellulose (400 cps.)	10.0 Gm.
Distilled Water	450.0 cc.
Glycerin	50.0 Gm.
Precipitated Calcium Carbonate	450.0 Gm.
Dentifrice Oils	9.0 cc.
Sodium Lauryl Sulfate, U.S.P. XIV	30.0 Gm.
Alkyl *p*-hydroxybenzoate	1.0 Gm.

Dissolve either the methyl or ethyl ester of the hydroxybenzoic acid in 150 cc. of boiling distilled water and pour over methylcellulose. While the mass swells and softens, continue stirring until the mixture cools. Gradually incorporate the remainder of the water which may be in the form of chipped ice or water at ordinary temperature will suffice. To this solution add the glycerin, followed by the precipitated calcium carbonate and the sodium lauryl sulfate if the latter is desired. Pass the mass through an ointment mill for homogeneity. Finally incorporate the oil. The aromatics used for flavoring may be either oil of peppermint, spearmint, or methyl salicylate. As an extra dulcifant, soluble saccharin may be added. By replacing 50 Gm. of precipitated calcium

carbonate with an equal quantity of titanium oxide, a snow white paste results. The sodium lauryl sulfate may be replaced by a determined amount of soft soap.

High viscosity methylcellulose can be used in ophthalmic preparations since it is nonirritating and chemically inert. It produces a highly transparent, viscous solution of the same index of refraction as the cornea.[37,38] In cases of keratoconjunctivitis, it can be used as a bland substitute for tears. Solutions of methylcellulose have been used with contact lenses.

Approximately isotonic nasal preparations can be made with methylcellulose. The solution has a sufficiently high relative viscosity so that it spreads readily.

EPHEDRINE NOSE DROPS[37]

Ephedrine Sulfate	1.0 Gm.
Chlorobutanol	0.5 Gm.
Sodium Chloride	0.85 Gm.
Methylcellulose	2.0 to 3.0 Gm.
Distilled Water, to make	100.0 cc.

A noteworthy use of methylcellulose is in the preparation of spinal anesthetic solutions. The viscosity of the anesthetic solution is increased without unduly increasing its specific gravity.[37] Methylcellulose solutions may prove effective as carriers to prolong the action of drugs administered by subcutaneous or intramuscular injection.[28] Preliminary tests indicate only slight transitory local reactions following injections of solutions containing 25 to 400 cps. methylcellulose.

Due to its non-antigenic property, low cost, and availability, methylcellulose has been suggested as another non-hematogenous plasma substitute.[39] The investigators have shown, however, that it is retained in the liver and thereby, interferes with the regeneration of plasma proteins by the liver.

Formulas for cough syrups and vehicles containing methylcellulose have been suggested for medication for diabetic individuals since methylcellulose has non-glycogenic properties.

METHYL CELLULOSE SOLUTIONS WITH FLAVORING AND COLORING AGENTS[40]

Methylcellulose	4.0 Gm.
Soluble Saccharin	0.4 Gm.
Synthetic Fruit Flavoring Agent	10.0 cc.
*Coloring Agent	3.0 cc.

To 100 cc. of a 4 per cent methylcellulose stock solution diluted to 900 cc. with distilled water, add 10 cc. of the synthetic fruit flavoring agent and 0.4 Gm. of soluble saccharin. This solution is then diluted with distilled water to make 1000 cc.

*The coloring agent may be either F.D.C. Red No. 2, F.D.C. Red No. 4, or F.D.C. Orange No. 1 as a one per cent solution.

COUGH MIXTURE NO. 1

Chloroform	1.0 cc.
Diluted Phosphoric Acid	25.0 cc.
Codeine Sulfate	2.0 Gm.
Methylcellulose Solution (above) containing either of the three coloring agents, to make	1000.0 cc.

COUGH MIXTURE NO. 2

Chloroform	1.0 cc.
Diluted Phosphoric Acid	25.0 cc.
Ipecac Fluidextract	4.0 cc.
Squill Fluidextract	4.0 cc.
Methylcellulose Solution (above) containing F.D.C. Red No. 4, to make	1000.0 cc.

COUGH MIXTURE NO. 3

Potassium Guaiacolsulfonate	75.0 Gm.
Methylcellulose Solution (above) containing F.D.C. Red No. 2, to make	1000.0 cc.

ETHYL CELLULOSE

Ethyl cellulose is made by the reaction of ethyl chloride with alkali treated cellulose.[41] It is soluble in organic solvents and is supplied in four viscosities. The viscosity designation is in centipoises (cps.). It is available as Ethocel from the Dow Chemical Company, Midland, Michigan and Ethyl Cellulose from the Hercules Powder Company of Wilmington, Delaware.

The medium grade viscosity is usually employed in pharmaceuticals and is valued for its film producing properties.[37] It is used in the formation of dermatological collodions.

COLLODION FORMULAS[37]

Ethyl Cellulose, Medium	40, 45 or 50.0 Gm.
Ethyl Alcohol	250.0 cc.
Ether	750.0 cc.
Ethyl Cellulose, Medium	40.0 Gm.
Camphor	20.0 Gm.
Castor Oil	30.0 cc.
Solvent (Alcohol 1 part, Ether 3 parts), to make	1000.0 cc.

Waxes may be used in the above formulas to give increased hardness.

CELLULOSE ACETATE PHTHALATE (CAP)

Cellulose esters have been introduced into the field of enteric coatings. Cellulose acetate phthalate can be made easily since the cellulose ester is easily accessible and phthalic anhydride is available. By the addition of increasing amounts of combined phthalate and cellulose acetate, a series with varying physical properties can be obtained.[42] Solutions of varying concentration of cellulose acetate phthalate in organic solvents may be prepared, which increase in viscosity as the concentration increases. The more useful cellulose esters are those in which only one carboxyl of the dibasic phthalic acid is combined with cellulose, the other acid group being esterified with an alkyl group or remaining in the acid form.

The following properties of cellulose acetate phthalate make it of value in enteric coatings: (1) Extremely insoluble in acid solutions. (2) Rapidly soluble in dilute alkaline solutions. (3) Forms a coating film. (4) Is non-toxic.[43,44] The disintegration of an enteric coating of cellulose acetate phthalate is due to the hydrolytic effect of intestinal esterases.[45]

A group at the Naval Medical Research Institute has used cellulose acetate phthalate in conjunction with salt therapy in cases of heat prostration.[37] Irritation of the gastrointestinal tract due to sodium chloride may be prevented if the salt absorption is slow. This is achieved by the impregnation of the sodium chloride with cellulose acetate phthalate. A honeycomb structure is formed which encapsulates small quantities of salt and thereby retards absorption.

CELLOPHANE

Cellophane, which is made from wood pulp or cotton, is used as a protective surgical dressing and is available as a moisture proof and grease proof product.[46] It has been used in the treatment of syphilitic aneurysms and aneurysms of thoracic vessels.[47,48] It is important to select the proper type of cellophane for introduction internally since certain types incite little or no foreign body reactions. The type of cellophane best suited for this use is 1.5 Mil Polythene (N V-7-14) supplied for experimental use by E. I. duPont de Nemours Company, Cellophane Division, Wilmington, Delaware. The material is sterilized by keeping it in 70 per cent alcohol for twenty-four to forty-eight hours prior to use. The cellophane is applied in from two to four thicknesses and is used purely to stimulate a fibroblastic reaction about the diseased area. Media consisting of perforated cellophane have been introduced in cytology.[49] The use of plasma as a medium is disadvantageous in certain cellular studies since the clot formation clouds cell details, it may destroy the culture, and interfere with the weight and chemical changes of the cells. Cellophane is particularly useful in the studies of cell nutrition, since it will not interfere with metabolism of the cell.

Cellophane tubing has been applied in the formation of the artificial kidney. The choice of cellophane is most important for effective dialysis.[50]

Cellophane sheets are useful as temporary closures for flasks and as a covering for flasks and containers to be sterilized. They are available in cut-to-size sheets from H. D. Catty Corporation, 160 Varick Street, New York 13, N.Y. Number 450 pt. cellophane is satisfactory for this use since it is not moistureproof and not heat sealing.

MISCELLANEOUS DERIVATIVES

Cellulose bands are used for sealing closures on sterile vials and other bottled pharmaceuticals. These bands provide positive package sealing. They are available in a wide variety of standard colors and in a wide range of sizes. The bands are regularly shipped in a wet state and are ready to use directly from properly lined containers. Cellulose bands are pure regenerated cellulose, odorless, noncombustible, harmless, and resistant to oils, fats, dirt, and dilute acids. They are available commercially as "Cell-O-Seal" from E. I. duPont de Nemours Company, Cellophane Division, Wilmington, Del. and as "Celons" from Celon Company, 2034 Pennsylvania Ave., Madison 4, Wisconsin. They are especially valuable in the prevention of or the detection of tampering with closures on small volume sterile products. Cellulose bands, size 20 x 15 mm, have specific application to the re-use of 20 mm aluminum seal vials. Other cellulose derivatives are used occasionally in pharmacy.

One such is hydroxyethylcellulose which is available under the trade name "Cellosize" from Carbide and Carbon Chemicals Corporation, New York 17, N.Y. A 10 per cent solution produces an almost colorless, nearly transparent film of greater clarity and higher tensile strength than is obtained from commercial methylcellulose solutions. Toxicity tests indicate that it is neither absorbed nor hydrolized in the gastrointestinal tract.[37,54]

Basic research on the conversion of wood to fermentable sugars with concentrated acids was done in 1819.[52] The first commercial application of this process was applied during World War I in plants in southern United States, whereby there were yields of 25 gallons of alcohol per one ton of dried wood. In the past few years, wood pulp has been used again in the production of carbohydrates and alcohol, due to the crisis that existed due to lack of essential carbohydrates. Improved processes have been developed in the

hydrolysis of wood.[53] By the use of 0.5 to 0.6 per cent sulfuric acid at 150-180 degrees C., yields of 64.5 gallons of 95 per cent alcohol were attained in 2.8 hours per ton of wood. Cost of the alcohol produced was $0.039 per gallon.

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NEW DRUGS for the treatment of

RHEUMATOID ARTHRITIS

By BERNARD E. CONLEY

RHEUMATOID arthritis is a chronic and frequently progressive disease of the joints which is characterized by inflammatory changes in the synovial membrane and articular structures and by atrophy and rarefaction of the bones. It can occur at any age, but generally makes its first appearance in young people between the ages of twenty to forty. The cause is unknown although constitutional inferiority, chronic infection, fatigue, heredity and physical and emotional stresses resulting from injury, shock or exposure to dampness and cold have been suggested as predisposing factors. Treatment consists of general rehabilitative measures centered around a program of physical therapy, rest, supervised diet, control of concurrent infection and medicaments, of which the gold salts have probably enjoyed the greatest acceptance. A cure has not been found although a number of new drugs have been recently widely publicized as rendering a temporary amelioration of this distressing condition. Among the several compounds which are being tried with varying degrees of success are cortisone, pregnenolone compounds, adrenocorticotropic hormone (ACTH), desoxycorticosterone in combination with vitamin C and glucuronolactone.

CORTISONE

Cortisone, Kendall's Compound E, (11-dehydro-17-hydroxycorticosterone) is one of twenty-eight metabolic and sex hormones which have been extracted in crystalline form from the adrenal cortex. Present supplies are obtained in very limited quantities by partial synthesis from desoxycholic acid of animal bile. This is an unusually difficult and expensive process which requires many months to complete. The alternate method of extracting the hormone from the adrenal glands of meat animals is even more costly and laborious. These prohibitions to large scale manufacture have directed attention to other possible sources of starting material. Steroidal sapogenins from the rhizomes of the tropical yam, *Dioscorea mexicana,* the seeds of an African vine, *Strophanthus sarmentosus* and from soybean wastes are under consideration for this purpose. However, the lack of suitable chemical technics for converting such substances into compound E coupled with the estimated low yield and anticipated demand for it obviates any optimistic feeling that immediate relief of the shortage can be expected from this quarter. The eventual solution of the problem appears to lie either in the complete synthesis of this vitally needed chemical or in the development of effective analogues of or substitutes for it.

The first alternative has met with little success so far. The second is receiving extensive study but it is too early to predict its future possibilities. The third, employing the adreno-

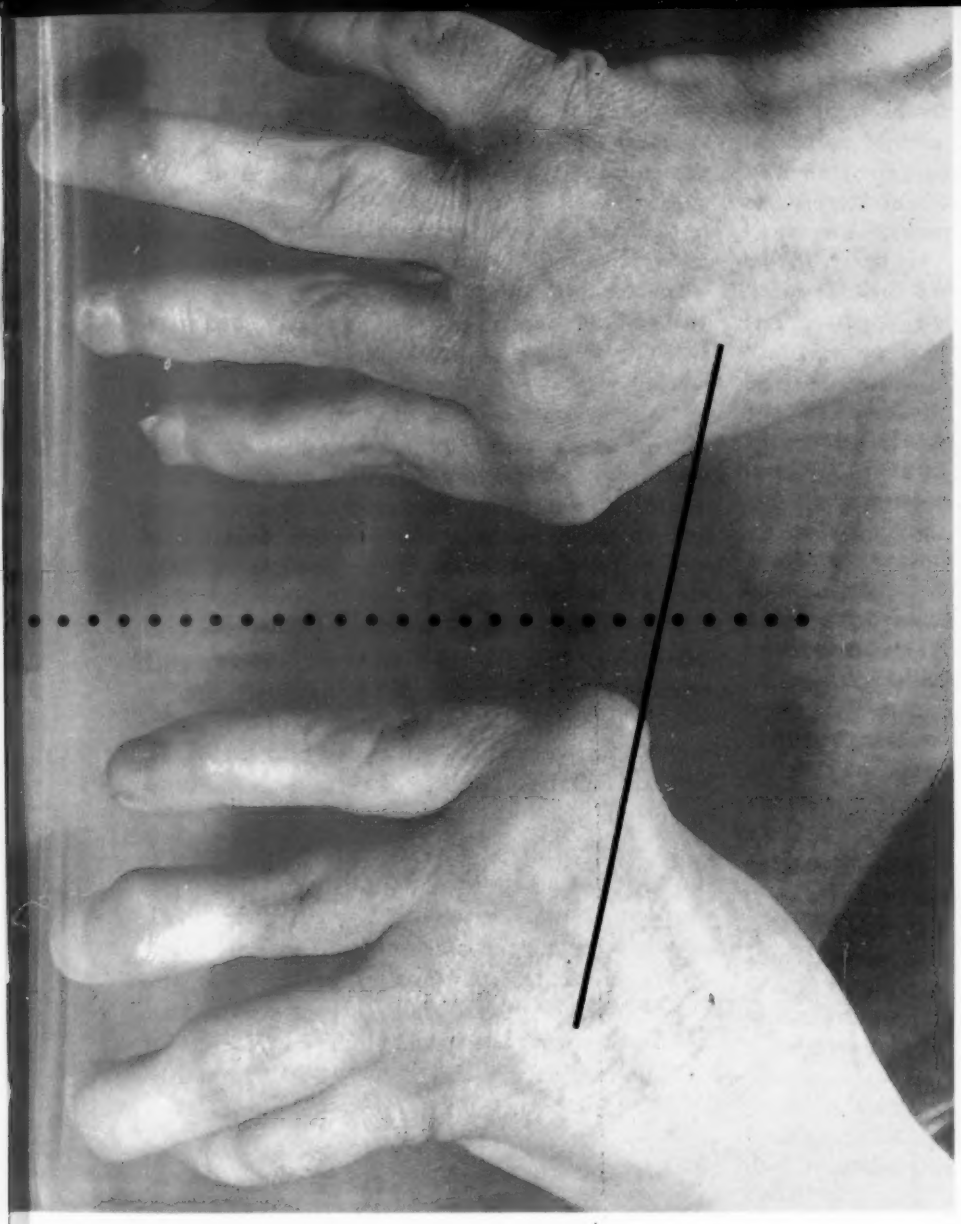

Photo Courtesy Parke Davis & Co.

corticotropic hormone (ACTH) of the pituitary and its derivatives offers some promise. Unfortunately ACTH shares with cortisone somewhat the same manufacturing difficulties.

ACTH

The ACTH molecule, like insulin and other complex proteins, continues to resist chemical reconstruction. Current production practices utilize pituitary glands from hogs in a multiple-stage extraction and purification operation which requires approximately a month for completion. Existing amounts are small, being limited by the number of hogs available and the cost of preparation. Recently it was reported that ACTH could be broken down into simpler elements, some of which retain most of the physiologic activity of the parent compound. ACTH fragments of an average chain length of eight amino acids were claimed to be able to effect stimulation of the adrenal cortices generally similar to that elicited by the whole molecule. Although peptides of this size cannot be readily produced in large quantities at this time, it has been speculated that this discovery is the first step in the evolution of less costly adrenocorticotropic substances.

The major physiologic effects of ACTH resemble those of cortisone and, with the possible exception of dosage, the results obtained with one can be duplicated with the other. With

ACTH the response is indirectly brought forth through a stimulation of the adrenal cortex to release compound E and other cortical hormones. Nonspecific excitants such as large doses of epinephrine also evoke corresponding reactions by arousing the anterior pituitary to deliver ACTH. The effectiveness of this approach is limited since the continued discharge of ACTH is prevented by increased secretion of cortical steroids. A basis for the action of these substances is unknown and nothing in the general pattern of their behavior suggests the mechanism of relief involved. Both ACTH and cortisone abate not only the primary symptoms of rheumatoid arthritis such as joint pains, swelling, and stiffness, but secondary manifestations such as elevated sedimentation rates, altered serum protein values and decreased hemoglobin and red blood cell count are likewise restored to normal. Improvement is usually confined to the period of their use and no means have been found to extend the benefit after the drugs are withdrawn.

SIDE EFFECTS

Prolonged administration or relatively large doses of either drug cannot be tolerated and if pursued may result in a serious generalized disturbance of the functions of the adrenal and pituitary glands. Among the "physiologic alterations" which have been reported are rounding of the facial contour (so-called "moon-face"), skin changes such as acne, hirsutism, keratosis pilaris, and cutaneous striations, muscular weakness, amenorrhea, edema and alkalosis, impaired carbohydrate tolerance, negative nitrogen balance and marked mental changes. Cortisone disturbs pituitary-adrenal function more readily than ACTH as it is inclined to suppress their joint activity, whereas ACTH's action is confined to the adrenal gland. ACTH, on the other hand, may increase blood pressure in essential hypertension in contrast to cortisone's tendency to reduce it in this condition. The possibility of the development of an irreversible insulin-resistant diabetes mellitus to prolonged use or excessive quantities of ACTH has also been raised. The use of repeated short courses of the minimum quantities of cortisone and ACTH necessary to effect remissions have been suggested as a means of avoiding these complications. This type of treatment is presently under study.

PREGNENOLONE

The search for cortisone substitutes has also embraced the vegetable sapogenins. Pregnenolone and its 21-acetoxy derivative which are synthetically derived from root constituents of the tropical yam are subjects of study from this field. While admitted to be slower acting and less efficient than compound E, they are claimed to be less "toxic" and to offer the advantages of being manufactured in quantity at a price within the reach of most arthritic sufferers. Little published information on their clinical efficiency is available at this writing.

Combination treatment with desoxycorticosterone and vitamin C was favorably commented upon by Swedish physicians last year. Subsequently, a variety of reports of both success and failure were made available, the majority of which failed to confirm the findings of the original investigators.

Glucuronolactone, a synthetic glucuronic acid derivative, has likewise received considerable attention as a rheumatic drug, especially in the public press. It is apparently of doubtful value for this purpose, although it may find usefulness in basic metabolic studies of certain mechanisms underlying rheumatic disorders.

As with all new therapeutic agents, the acceptance of these compounds for treatment purposes should be withheld until their usefulness has been clearly demonstrated. This reservation has equal application to many of the older remedies which are receiving renewed attention because of awakened public interest in rheumatoid arthritis.

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NEW CONCEPTS

in Inventory and Purchasing Control

By JOHN KEIG

I SHOULD like to outline to you one way in which a monthly record of income and expenditures of the pharmacy may be secured, and at the same time a money control of the general stock maintained without the requirement of a perpetual inventory. I understand that the Federal Government is adamant about perpetual inventory records on narcotics and alcohol, and I do not mean to suggest that they be eliminated. My reference is to a perpetual inventory of the general stock of the pharmacy.

In glancing through one of the hospital journals recently, I came across a list of approved standards of the Association of Hospital Pharmacists of the Midwest. Among the standards listed under the title of Business Management appeared the following:

STOCK CONTROL

- Perpetual Inventory
  - Narcotic (required)
  - Alcohol (required)
  - General Stock (optional)
- Records and Reports
  - Monthly report of cost of material supplies to other departments
  - Records of expenditures and income of department obtained from department records or general office
  - Yearly Inventory

These are worthy standards and I wonder how many hospitals are able to live up to them, particularly as regards the record of expenditures and income, and perpetual inventory of the general stock.

Generally, it is up to the hospital accounting office to maintain the necessary records to prepare these statements, but it is my experience that this cannot be done without the aid and cooperation of the pharmacist. Moreover, after their preparation, it will be the pharmacist who will be most interested in the results shown, since it will be a guide to him in the future conduct of the operations of the Pharmacy Department.

First, let me outline a summary monthly statement of the hospital pharmacy income and expenditures. The statement may take form as shown below. This is a simple statement which can be prepared monthly. It will be found advantageous to present a similar statement for the year to date by adding the current month's statement to the totals for the previous months. Most of the items shown in the statement must be accumulated in the general accounting records by months. With a little foresight on the part of the hospital accountant and the pharmacist, the general records, with one exception, can be expanded to furnish the information necessary to prepare the report. Let us review the pharmacy transactions to prove this point.

NAME OF HOSPITAL

MONTHLY STATEMENT OF PHARMACY OPERATIONS

Month of _____

Sales		_____
Cost of Sales		
Direct Expenses		
Material	_____	
Salaries (Labor)	_____	
Supplies	_____	
Indirect Expenses	_____	
Total cost of Sales		_____
Net Operating Result		_____

RECORD OF SALES

Included in the category of sales will be all items leaving the pharmacy for consumption. This will eliminate returned purchases which will operate to reduce the material cost instead of being added to sales. Specifically sales may be divided into three groups; namely, inpatients, outpatients, and hospital departments.

Prescriptions prepared for inpatients, priced in accordance with hospital policy, and for which the patient is expected to pay will be charged to the patient's account and credit made to pharmacy inpatient sales on the general accounting books. An accumulation of all credits in this

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Presented at the Second Institute on Hospital Pharmacy, Chicago, May, 1947.

account for a month will furnish the total of this activity for the pharmacy.

Outpatient prescriptions, also priced at a figure in accordance with hospital policy, will usually be paid for in cash and can be recorded on a cash register which will furnish the total sales price at the end of a day or accumulated for a monthly period. These totals will be credited to outpatient sales in the general accounts, and of course will agree with the total of the cash turned in by the pharmacy.

Products from the pharmacy furnished to hospital departments will include those furnished to nursing floors for floor stock, and to other departments of the hospital, such as diet supplements to Nutrition Department, cleaning agents to Housekeeping Department, etc. In hospitals using an inclusive rate plan where an overall service charge is made, the patient's drug requirements will be included in this classification. The departmental requirements will usually be made known to the pharmacy by requisition which after pricing and extending will be charged to the requisitioning department on the general accounting books. The account, Pharmacy Sales—Hospital Departments, will be credited with this figure. The basis for the charge will be cost, about which we will hear more later.

It will be noted that this latter procedure will meet one of the requirements outlined by the Association of Hospital Pharmacists of the Midwest; namely, "Monthly cost of material supplies to other departments." In speaking of the cost of material, I am assuming that by this term is meant the cost of the pharmacy's finished product including cost of dispensing and not the raw material cost.

MATERIAL COST

Material costs will consist of the raw or basic drugs used by the pharmacy in making the finished product, including cost of containers, except those containers used in dispensing floor stock which are returnable by the floors for re-use.

At the end of a fiscal period, without the use of a perpetual inventory, accountants arrive at the cost of materials consumed by using the following formula:

> To the physical inventory at the beginning of a period are added the purchases for the period to arrive at the value of material to be accounted for. From this is deducted the physical inventory at the end of the period to get the cost of materials consumed.

This is called the disappearance method of arriving at the material cost, and can be secured only by taking a physical inventory. I need not tell you what a problem it would be if a physical inventory were required each month in order to find the material cost. Maintaining a perpetual inventory of the raw materials and finished product in pharmacy stock would be a time-consuming task.

I should like to suggest to you a different method of arriving at the desired result without resorting to a physical inventory or maintaining a perpetual inventory record. Suppose we place a firm price, which we will call the standard price, on each raw material item purchased and carried in stock. The standard price will take into consideration the present unit cost as well as the reasonable fluctuations which may be anticipated one year from now. As each item is purchased, without regard to the purchase price, the total amount, representing the number of units multiplied by the standard price will be charged to one account on the general accounting books called "Pharmacy Materials." The difference between this amount and the cost, whether higher or lower, will be charged or credited to another account in the same books, called "Pharmacy Material Variations."

With a standard price for all ingredients going into each prescription or formula being compounded, it is an easy matter to arrive at standard material cost for each finished product. With the preparation of an alphabetical list of all finished products handled by the pharmacy, we are in a position to price all formulary prescriptions and requisitions.

After prescriptions or requisitions are filled by the pharmacy the cost is easily applied to each item. This job is generally the responsibility of an employee of the General Accounting Department. A monthly summary of all these material costings will provide the entry necessary to arrive at the total standard cost of materials sold during the period.

With this information, the formula for arriving at the cost of material consumed for the month is used in the following manner to secure the estimated inventory at the end of the month:

ESTIMATED INVENTORY

Inventory at beginning of period (Standard prices)		_____
Purchases (at standard prices)	add	_____
Cost of Materials Consumed	subtract	_____
Inventory at end of period (estimated)		_____

Please let me repeat that by following this procedure there is no need to maintain individual records of units of each raw product, nor of the finished product as would be necessary in a perpetual inventory system.

Little has been said of the Pharmacy Material Variation Account, and the disposition of the amount accumulated in this account. At the end of the year, the net amount whether a debit or

credit balance, will require adjustment. The total accumulated will relate directly to the inventory at the beginning of the period and to the purchases during the year. In the formula I gave before, the sum of the latter two figures was called the "Value of Material to be Accounted For." It is reasonable to assume that the "Pharmacy Material Variation" account can be divided between "Cost of Materials Consumed" and "Inventory at End" in the same percentage that these two accounts bear the "Value of Material to be Accounted For."

That portion allocable to "Cost of Materials Consumed" will increase or decrease that amount on the Operation Statement. The portion allocable to "Inventory" will affect that account and be carried forward to next year's operations.

LABOR

Labor cost in the Pharmacy may be divided into three classifications; namely, manufacturing, dispensing, supervision and clerical.

Manufacturing consists of the mixing of prescriptions, etc., on a bulk basis as contrasted to the preparation of a special prescription which may be placed in the category of dispensing. It will also include the packaging cost.

Dispensing will include the issuance to outpatients of drugs previously prepared, special prescriptions, the delivery of inpatient prescriptions and the delivery of items requisitioned for use in hospital departments, including the nursing floors.

Supervision and clerical will include the salary of the chief pharmacist and whatever clerical help is necessary to carry on the responsibilities of the pharmacy.

The pharmacy labor cost will come from the payroll records, maintained by the General Accounting Office. If wages are paid on a monthly basis an accurate cost may be reflected in the accounts. However, if wages are paid on a weekly basis, it may be necessary to accrue wages earned, but unpaid as of the close of a month. By this procedure, a more accurate labor cost will be reflected in each month's statement of operations.

SUPPLIES

A separate account will be maintained in the general books for all supplies used in the pharmacy and not charged to the Pharmacy Materials Account, for example: stationery, containers used in packing finished products going to hospital departments, paper used in measuring raw materials being compounded, small tools not chargeable to equipment, etc.

As the relative cost of these supplies is small, it will be feasible to charge the cost to expense as purchased.

INDIRECT EXPENSES

No cost statement for the operation of the hospital pharmacy is complete without the inclusion of those indirect expenses such as:

1. Light, heat, and power.
2. Refrigeration.
3. Housekeeping (if the pharmacy rooms are cleaned by that department).
4. Depreciation of buildings and building fixtures.
5. Depreciation of pharmacy equipment.
6. Laundry.
7. Administration.
8. Dietary (if meals are served).

The formulas for arriving at the amount chargeable to the hospital pharmacy for each of these costs are intricate and will vary according to the method used by the general accountant of each hospital, in allocating them departmentally. As little control can be exercised by the pharmacist over the amount, he will have to accept them as charges against his department, just as the other hospital departments must accept the charges of the hospital pharmacy for the materials furnished to them by the pharmacy.

Thus, we have a statement of the income and expenditures of the hospital pharmacy for one month. As stated previously, in order to secure similar figures for the year to date, these figures may be secured by accumulating each month's statements by account classification.

This is not; however, the end product which I have in mind. In the foregoing, I have tried to make the explanations as simple as possible. But, as I have stated before, the pharmacy conducts its business with three major groups of consumers of its products; namely, inpatients, outpatients, and hospital departments.

Each of these consumers presents specific problems to the pharmacist and to the hospital administration. The question will surely arise as to how much of a profit or a loss shall be sustained in the charges to each group. This leads us naturally to the problem of breaking down our original statement into separate results for each activity. Let us see how this may be done.

In the previous mention of sales, reference was made to the method by which credit might be given to the Pharmacy for its sales. Let me repeat:

> "Prescriptions prepared for inpatients, priced in accordance with hospital policy, and for which the patient is expected to pay will be charged to the patient's account and credit made to pharmacy inpatient sales on the general accounting books. An accumulation of all credits in this account for a month will furnish the total of this activity for the Pharmacy.
>
> Outpatient prescriptions, also priced at a figure in accordance with hospital policy, will usually

be paid in cash and can be recorded on a cash register which will furnish the total sales price at the end of a day or accumulated for a monthly period. These totals will be credited to outpatient sales in the general accounts, and of course will agree with the total of the cash turned in by the Pharmacy.

Pharmacy products furnished to hospital departments will include those furnished to nursing floors for floor stock, and to other departments of the hospital, such as diet supplements to Nutrition Department, cleaning agents to Housekeeping Department, etc. In hospitals using an inclusive rate plan where an overall service charge is made, the patient's drug requirements will be included in this classification. These departmental requirements will usually be made known to the Pharmacy by requisition which after pricing and extending will be charged to the requisitioning department on the general accounting books. The credit will go to Pharmacy Sales—Hospital Departments. The basis for the charge will be cost, about which we will hear more later."

Thus in the accumulation of the sales figures, provision has been made for their segregation into classes of sales. Material costs may be accumulated by class of sales. Instead of making one entry to reflect the total material costs of sales, the entry will be composed of three parts, showing totals for inpatients, outpatients, and hospital departments. Labor costs may be divided into the three groups in the following manner:

Manufacturing Labor. On the ratio of the material cost chargeable to each of the divisions.

Dispensing Labor. On an assignment basis. The time spent by pharmacy employees in filling special prescriptions for inpatients and outpatients, and then dispensing or delivering them, will be accumulated and distributed to the proper sales grouping.

Supervision and Clerical Labor. The distribution of this labor cost may be made in the ratio of this cost to the labor cost of manufacturing and dispensing. The table shown below will serve as an illustration of the method of distribution of the labor cost for a month.

Supplies as they are ordered will be for one specific department and the cost thereof distributed to the proper class of product. For instance, containers for ether when purchased or requisitioned from a general storeroom will be charged to the supply expense of the hospital departments, since ether will not generally be dispensed to inpatients or outpatients on prescription.

The indirect expense of the Pharmacy will be divided between the three groups either on the ratio of the material cost or the material and labor cost. It will not matter much which method is used.

With the distribution of sales and expenses we are in a position to compute the net results for each sales group. We can now determine whether the inpatient and outpatient sales have been priced at an amount which will give us the desired result in accordance with the policy of the hospital. It will also determine whether or not sufficient charges have been made to hospital departments to cover the overall cost of the items requisitioned from the Pharmacy. If it is necessary to adjust the prices charged to patients or the hospital departments, the information is available on an overall basis to make the changes.

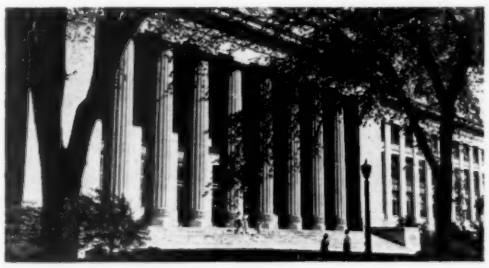
Mention should be made of one method of arriving at the charge to be made to hospital departments for the products of the Pharmacy purchased by them. After some experience in computing the cost of these items, a relationship will be apparent between the material cost and the other costs which may be expressed percentagewise. By giving the material cost the worth of 100, it will be found that the labor cost relationship might be 20, the supplies 2 and the indirect expenses 8 for a total of 130. As we know the material cost of each pharmacy product, the total cost for charging hospital departments may be expressed as 130 per cent of the material cost. This method will be found to be of great value to those pharmacists who may wish to follow the procedure outlined in this paper.

Labor Cost Distribution

Pharmacy Staff	Total Cost	In-Patients	Out-Patients	Hospital Departments
1 Pharmacist—Manufacturing	$ 250.00	$ 25.00	$ 50.00	$175.00
1 Pharmacist—Outpatients	200.00		200.00	
1 Pharmacist—Inpatients	200.00	75.00		125.00
1 Helper	150.00	50.00		100.00
Sub Total	800.00	150.00	250.00	400.00
Percent to total		19%	31%	50%
1 Clerk	100.00			
1 Chief Pharmacist	500.00			
	600.00	150.00	185.	300.00
Total	$1,400.00	$265.00	$435.6	$700.00

SIXTH INSTITUTE ON HOSPITAL PHARMACY

THE SIXTH INSTITUTE on Hospital Pharmacy is scheduled at the University of Michigan, Ann Arbor, from June 19 to 23 inclusive. Sponsored by the American Hospital Association, the American Pharmaceutical Association, and the American Society of Hospital Pharmacists, the purpose of the institute is to present in concentrated form a basic and integrated program covering several facets of the practice of pharmacy in hospitals. Certificates of attendance will be issued by sponsoring organizations to those who attend all sessions.



Angell Hall, on the Campus of the University of Michigan

Three principal themes will be covered by this year's program: administrative practices and policies; pharmaceutical aspects of production and utilization of currently important drugs; and current trends in pharmacology and therapeutics. The five-day program will include lectures, demonstrations, panel discussions and a workshop on problems in hospital pharmacy. The sessions will be held each morning and afternoon and, in addition, three evening events are scheduled, one of which will consist of a tour of the Department of Pharmacy of the University of Michigan Hospital followed by a social hour.

The meetings will be held in the Mosher-Jordan Halls which are located one-half block from the University Hospital on the campus of the University of Michigan.

Room Accommodations

Rooms for all attending the Institute will be available in the Mosher-Jordan Halls. Single or double rooms may be requested with no difference in charge. A flat rate for room and meals during the Institute has been established at $32. For rooms, this charge is for the period beginning Sunday evening prior to the opening of the Institute and continuing through Friday night, if needed. Meals will be served beginning Monday morning through Friday evening. Also included in this rate is the social hour on Monday evening and the final Institute dinner to be held on Friday.

Fees

The registration fee for the Institute is $30. This fee, together with the room and board fee ($32), should be mailed to the American Hospital Association at the time the application for the Institute is submitted. Checks should be made payable to the American Hospital Association.

Eligibility

The applicant must be a member of the American Pharmaceutical Association and the American Society of Hospital Pharmacists, or his institution must be a member of the American Hospital Association.

(continued next page)

The Pharmaceutical Laboratory and the Dispensary at University Hospital.

Application blanks will be mailed to the members of the American Society of Hospital Pharmacists and to member hospitals of the American Hospital Association soon after May first. These applications should be completed and mailed, together with the necessary fees, to Charles T. Dolezal, M.D., Secretary, Council on Professional Practice, American Hospital Association, 18 East Division Street, Chicago 10, Illinois. The applicant will be notified of his acceptance or rejection. Since the maximum number which can be accommodated is 150, members are urged to forward their applications as soon as possible after they are received.

Ann Arbor is located approximately 40 miles west of Detroit and 50 miles north of Toledo. It may be reached by the New York Central railroad, by various bus lines, and very conveniently by airlines since the Detroit Willow Run airport is located only about 30 minutes from Ann Arbor by cab.

Program committee for the Institute included Don E. Francke, chief pharmacist, University Hospital, chairman; C. T. Dolezal, M.D., assistant director, American Hospital Association; Robert P. Fischelis, Sc.D., secretary, American Pharmaceutical Association; A. C. Kerlikowske, M.D., director, University Hospital; Gloria Niemeyer, assistant director, Division of Hospital Pharmacy; and I. Thomas Reamer, chief pharmacist, Duke Hospital.

SIXTH INSTITUTE FACULTY

ADCOCK, John D., M.D., assistant professor of Internal Medicine, University of Michigan Medical School, Ann Arbor.

BARNETT, Charles, chief pharmacist, St. Luke's Hospital, Jacksonville, Florida.

BARNETT, Dwight, M.D., administrator, Harper Hospital, Detroit.

BOWLES, Grover C., chief pharmacist, Strong Memorial Hospital, Rochester, New York.

BRYANT, J. Marion, M.D., assistant professor of Internal Medicine, University of Michigan Medical School.

CADMUS, Robert R., M.D., assistant director, University Hospitals of Cleveland, Cleveland.

CATALINE, Elmon L., associate professor of Pharmacy, College of Pharmacy, University of Michigan, Ann Arbor.

COLLER, Frederick A., M.D., professor of Surgery, chairman of Department of Surgery, University of Michigan Medical School, Ann Arbor.

DOLEZAL, Charles T., M.D., assistant director, American Hospital Association, Chicago.

FISCHELIS, Robert P., Sc.D., secretary, American Pharmaceutical Association, Washington, D.C.

FLACK, Herbert L., chief pharmacist, Jefferson Medical College Hospital, Philadelphia.

FRANCKE, Don E., chief pharmacist, University Hospital, University of Michigan, Ann Arbor.

HANSEN, Hans S., administrator, Grant Hospital, Chicago.

KERLIKOWSKE, Albert C., M.D., director, University Hospital, University of Michigan, Ann Arbor.

LAWRENCE, Carl A., Ph.D., assistant professor of bacteriology, University of Michigan, Ann Arbor.

McGIBONY, John R., M.D., chief, Division of Medical and Hospital Research, United States Public Health Service, Washington, D.C.

MEYERS, Muriel C., M.D., assistant professor of Internal Medicine, research assistant Simpson Memorial Institute, University of Michigan Medical School, Ann Arbor.

MOE, Gordon K., M.D., associate professor of Pharmacology, University of Michigan, Ann Arbor.

NIEMEYER, Gloria F., assistant director Division of Hospital Pharmacy, Washington, D.C.

OLIN, Philip J., personnel officer, University Hospital, University of Michigan, Ann Arbor.

PHILLIPS, George L., assistant chief pharmacist, University Hospital, University of Michigan, Ann Arbor.

PIERPONT, Wilbur K., Ph.D., controller of the University, University of Michigan, Ann Arbor.

PURDUM, W. Arthur, Ph.D., chief pharmacist, Johns Hopkins Hospital, Baltimore, Maryland.

REAMER, I. Thomas, chief pharmacist, Duke Hospital, Durham, North Carolina.

ROBINSON, WILLIAM D., M.D., associate professor of Internal Medicine, and in charge Rackham Arthritis Research Unit, University of Michigan Medical School, Ann Arbor.

ROGAN, Jane L., chief pharmacist, Evangelical Deaconess Hospital, Detroit.

SHELDON, John M., M.D., associate professor of Internal Medicine, University of Michigan Medical School, Ann Arbor.

STOCKING, Charles H., professor of Pharmacy and dean of College of Pharmacy, University of Michigan, Ann Arbor.

SULLIVAN, Arthur J., administrator, Springfield City Hospital, Springfield, Ohio.

ZUGICH, John J., chief pharmacist, Grace-New Haven Hospital, New Haven, Connecticut.

SIXTH INSTITUTE PROGRAM

■ *Monday, June 19*

Hospital Pharmacy Organization

ROBERT P. FISCHELIS, *Presiding*

8:00 to 9.30 A.M. Registration

9:30 to 10:30 A.M. Greetings:
American Hospital Association
CHARLES T. DOLEZAL
American Pharmaceutical Association
ROBERT P. FISCHELIS
American Society of Hospital Pharmacists
I. THOMAS REAMER
University of Michigan College of Pharmacy
CHARLES H. STOCKING
University Hospital
ALBERT C. KERLIKOWSKE
University Hospital Pharmacy
DON E. FRANCKE

10:30 to 11:30 A.M. Fundamental Principles of Organization and Administration
WILBUR K. PIERPONT

1:30 to 2:15 P.M. Principles of Departmental Organization and Administration Within the Hospital
PHILIP J. OLIN

2:30 to 3:15 P.M. Expanding Pharmacy Service in the Hospital
ARTHUR J. SULLIVAN

3:30 to 4:15 P.M. The Attitudes and Responsibility of the Pharmacist as a Member of the Medical Team
FREDERICK A. COLLER

7:00 to 9:00 P.M. Open House and Tour of the Pharmacy Department of the University Hospital

9:00 to 11:00 P.M. Social Hour—Mosher-Jordan Halls

■ *Tuesday, June 20*

Hospital Pharmacy Administration

ROBERT R. CADMUS, *Presiding*

8:30 to 9:30 A.M. The Application of the Minimum Standards to Pharmacy Organization and Policy
W. ARTHUR PURDUM

9:30 to 10:20 A.M. The Elements of Planning a New Pharmacy Department or Pharmacy Expansion
JOHN R. MCGIBONY

10:30 to 12:00 The Initiation and Development of a Therapeutics Committee in a Small Hospital
Panel Discussion: ROBERT R. CADMUS, JANE L. ROGAN, CHARLES BARNETT, and HANS S. HANSEN

1:30 to 2:20 P.M. Essential Business Records for the Pharmacy
JOHN J. ZUGICH

2:30 to 3:20 P.M. A Rational Basis for Prescription Charges
HANS S. HANSEN

3:30 to 4:20 P.M. Pharmacy Cost Control
HERBERT L. FLACK

7:00 to 9:00 P.M. Discussion: Pharmacy Administration and Policy
HANS S: HANSEN, *Chairman*

■ *Wednesday, June 21*

Current Trends in Pharmacology and Therapeutics

DON E. FRANCKE, *Presiding*

8:30 to 9:20 A.M. The Pharmacology of Autonomic Drugs
GORDON K. MOE

9:30 to 10:20 A.M. Cardiac Drugs
J. MARION BRYANT

10:30 to 11:20 A.M. Drugs Used in Anemia and Related Blood Disorders
MURIEL C. MEYERS

1:30 to 2:20 P.M. Drugs Used in the Treatment of Arthritis
WILLIAM D. ROBINSON

2:30 to 3:20 P.M. A Survey and Evaluation of the Antihistamine Drugs
JOHN M. SHELDON

3:30 to 4:00 P.M. Recess

4:00 to 4:45 P.M. The Present Status of Antibiotics
JOHN D. ADCOCK

■ *Thursday, June 22*

Pharmaceutical Aspects of Production, and Utilization of Currently Important Drugs

I. THOMAS REAMER, *Presiding*

8:30 to 9:20 A.M. The Sulfonamides
GROVER C. BOWLES

9:30 to 10:20 A.M. Eye Solutions
ELMON L. CATALINE

10:30 to 11:20 A.M. The Antibiotics
W. ARTHUR PURDUM

1:30 to 2:20 P.M. The Vitamins
HERBERT L. FLACK

2:30 to 3:20 P.M. Miscellaneous Drugs
GEORGE L. PHILLIPS

3:30 to 4:15 P.M. A Survey and Evaluation of Germicides
CARL A. LAWRENCE

7:00 to 9:00 P.M. Open Discussion
GLORIA NIEMEYER, *Chairman*

■ *Friday, June 23*

Workshop on Problems in Hospital Pharmacy

CHARLES T. DOLEZAL, *Presiding*

Suggested Topics:
1—Afterhours and Emergency Requests for Drugs
W. ARTHUR PURDUM
2—Narcotic Control Methods
HERBERT L. FLACK
3—Refilling of Prescriptions
JOHN J. ZUGICH
4—Teaching Pharmacology to Nurses
JANE L. ROGAN
5—Extra-Pharmaceutical Services
I. THOMAS REAMER
6—Who Shall Do the Purchasing for the Pharmacy?
HANS S. HANSEN
7—When Is It Possible to Manufacture?
GROVER C. BOWLES

1:30 to 3:30 P.M. Oral Summaries of the Discussions and the Decisions Reached in the Morning Discussion Groups

3:30 to 4:20 P.M. Present Plans for the Expansion of Medical Care
DWIGHT BARNETT

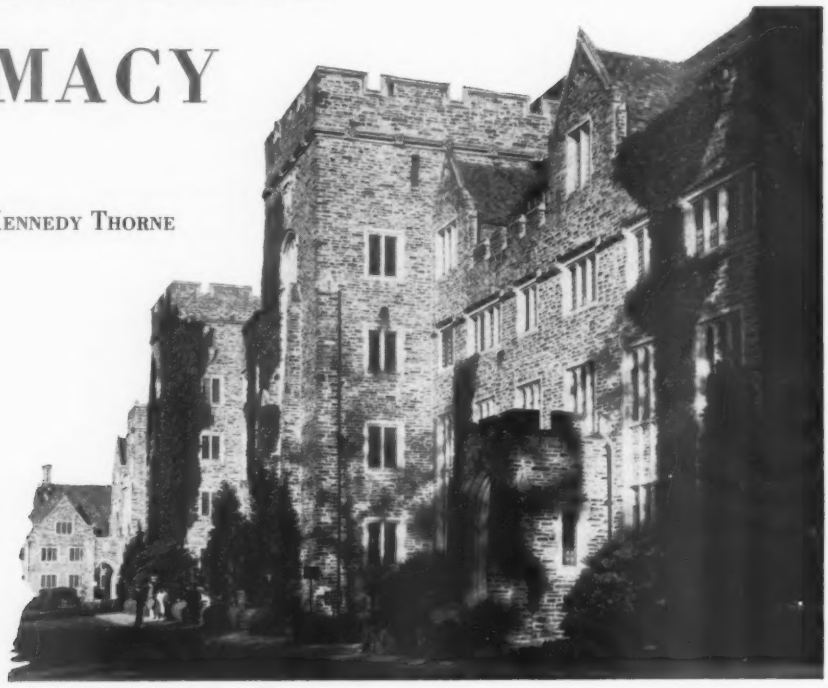
6:00 P.M. Dinner and Award of Certificate
ALBERT C. KERLIKOWSKE

University Hospital
University of Michigan
Ann Arbor

Efficiency, economy, service and loyalty
have been this pharmacy's aims for twenty years

DUKE HOSPITAL PHARMACY

By Mrs. Lucy Kennedy Thorne



DUKE Hospital Pharmacy will celebrate its 20th anniversary on July 21, 1950. If a party were to be given to celebrate the event, the person who would sit at the head of the table would be a man who devoted his life's work to hospital pharmacy. Mr. Robert S. Fuqua, a native of our Tar Heel State, who was chief pharmacist at Johns Hopkins Hospital when our hospital was begun, gave Dr. W. C. Davison, dean of the Duke University Medical School and director of the Duke Hospital, floor plans and ideas for the physical layout. He also trained Mr. I. T. Reamer, a graduate of the University of Maryland School of Pharmacy, during the years from March of 1925 until he took over the duties as chief pharmacist at Duke Hospital in 1931. Mr. Fuqua stressed efficiency, economy, service and loyalty, and Mr. Reamer has continued to focus attention on all of these points during the past two decades.

Mrs. Lucy Kennedy Thorne is Assistant Chief Pharmacist, Duke Hospital, Durham, N.C.

The pharmacy serves a 600 bed hospital, an outpatient clinic which averages over 500 visits daily, a student body of 5,000, and purchases all the chemicals needed for the medical school. It is located on the ground floor and occupies a floor space of approximately 2,600 square feet. It has nine rooms—two for manufacturing, two for storage, and one room for each of the following: prescription work, laboratory, alcohol vault, office and water still.

The staff consists of the chief pharmacist, two staff pharmacists, three graduate intern pharmacists, a secretary, two orderlies, a maid and a part-time student helper.

Pharmacy hours are from 8:30 A.M. to 5 P.M. daily except Saturday, Sunday and holidays when the hours are from 8:30 A.M. to 1 P.M. A pharmacist is on call at all times for emergency requests.

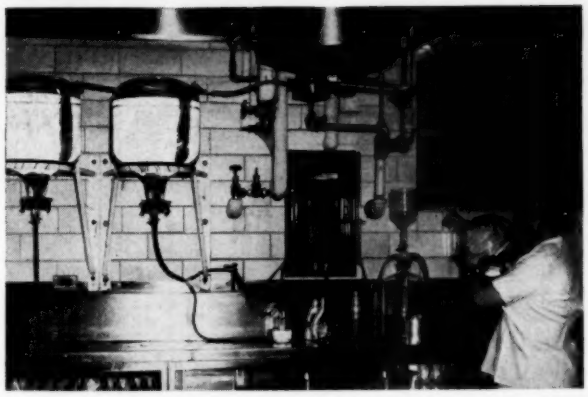
The time required for dispensing medications is reduced to a minimum because adequate stocks of all drugs in common use are kept in

each ward medicine cupboard. This system eliminates special orders for each patient. Our orderly collects all trays before 8:30 A.M. and pharmacists fill all routine hospital orders by 10 A.M. We are then ready to serve the out-patient clinic requirements or to proceed with the manufacturing.

Our flat-rate system, or all-inclusive rate, whereby all drugs are furnished at no extra cost to the patient, was modified shortly after penicillin became so popular. We still do not charge extra for penicillin; however, all newer antibiotics are charged to the patient.

A normal prescription pricing system is used in making the charges on these drugs. When research drugs which we must buy from the manufacturer are used, no profit mark-up is made. At the present time this group is limited to ACTH and Cortisone.

In all of our dispensing, we stress the protection of the drugs so that they will have full potency when used by the patient. Expiration date labels are used on all eye solutions; return-to-pharmacy stickers if not used by a certain

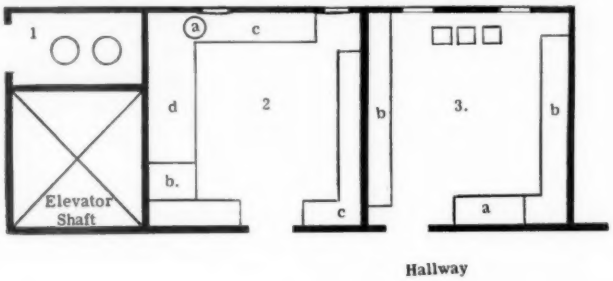


Parenteral solutions room at Duke

date are placed on infrequently prescribed liquid preparations, and a check of all ward medicine cupboards is made every three months for excess supplies.

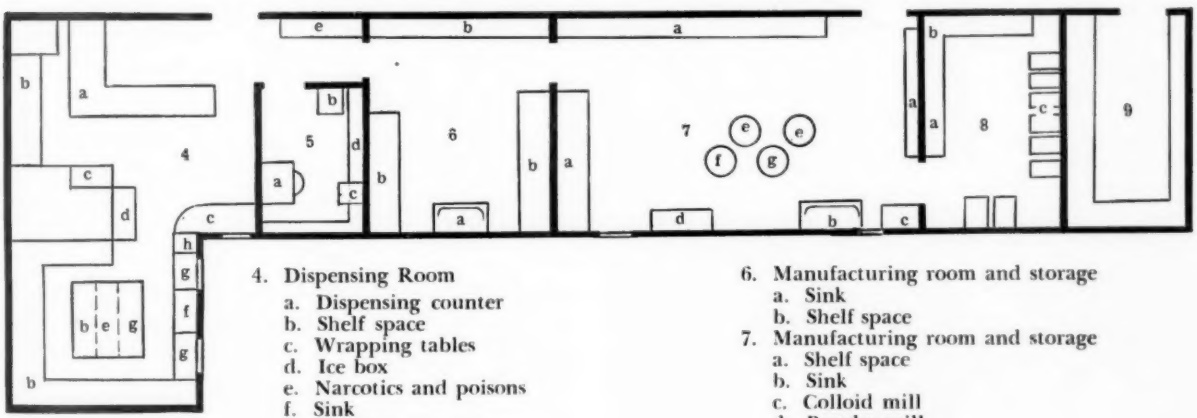
When we experienced difficulty in getting all of our bulk liquids in our regular drug tray, we initiated the "Pharmacy Exchange Truck." This truck, loaded with mouth wash, liquid soap,

Duke University Hospital Pharmacy



1/8 inch equals 1 foot

1. Still Room
2. Solution Room
   a. Distilled water tank
   b. Sink
   c. Shelf space
   d. Working counter
3. Room for preparing and dispensing laboratory solutions
   a. Sink
   b. Shelf space



4. Dispensing Room
   a. Dispensing counter
   b. Shelf space
   c. Wrapping tables
   d. Ice box
   e. Narcotics and poisons
   f. Sink
   g. Working counters
   h. Current prescription file
5. Office
   a. Chief pharmacist's desk
   b. Secretary's desk
   c. Literature file
   d. Library space
6. Manufacturing room and storage
   a. Sink
   b. Shelf space
7. Manufacturing room and storage
   a. Shelf space
   b. Sink
   c. Colloid mill
   d. Powder mill
   e. Alcohol tanks
   f. Lysol tank
   g. Soap tank
8. Vault
   a. Narcotics (reserve storage)
   b. Shelf space
   c. Alcohol
9. Bottle room (storage)

mineral oil, glycerin, cresol solution, salt compress solution and alcohol, is sent to all locations daily and the full bottles are exchanged for the empties. It saves time for the nurses in making out the drug requisitions since the orderly merely checks a printed form which lists all the units served by the truck.

The trend toward the use of drugs which cannot be manufactured in the pharmacy makes it imperative that the pharmacists keep up-to-date with information regarding source of supply, dosage and trade names. Once a week the pharmacy staff meets for a one hour period devoted to a review of all literature received during the previous week. Interns are assigned the task of filing this literature so that it is readily available for our hospital staff. Administrative and medical staff personnel are invited to speak to the pharmacy staff at intervals. Our pharmacists are made to feel that they are a part of the medical team working as a unit for the best interests of the hospital and the patient.

MANUFACTURING

Manufacturing is emphasized, and the department manufactures most standard preparations in the U.S.P. and N.F. and those that are included in the hospital formulary. Special equipment includes: a powder mill, colloid mill, tube filling machine, water still (30 gallons per hour), transfer pump, Alsop electric mixer, four 100-gallon glass lined tanks, E burner gas stove, and a filter rack.

A record is kept on all the manufacturing, which includes the formula, method of procedure, date, and amount manufactured. This serves as a control data until preparations are used and gives complete statistical record.

The Fenwal system is used in making over 8,000 flasks of parenteral solutions monthly.

The staff at Duke: Mr. I. T. Reamer, Miss J. L. Smith, Mrs. J. Northcutt, Mr. W. T. Collier, Mrs. V. Callahan, and Mrs. L. K. Thorne.

Recently the solution room has been moved to our new Central Supply Room. All cabinets are metal, with stainless steel working counters. A special drying rack has been made, so that bottles may be washed and inverted for draining. Wards obtain parenteral solutions directly from the solution room by ordering on printed forms listing all the solutions. Empty bottles must be returned before new ones are delivered.

In 1933, a book of formulas was prepared containing the principal medications stocked as a convenient guide to the hospital staff. It proved to be so successful, that a year later it was revised. A committee from the Duke Medical School was appointed to help with the revision, so that it would conform more closely to the teaching program of the medical school. It is revised every two or three years to include the current drugs.

The hospital publishes a weekly bulletin. The pharmacy section supplies information on new drugs stocked, formulas of new preparations manufactured, changes in dispensing policies and comparative cost of expensive products.

The pharmacy personnel is encouraged to take an active part in the local and state organizations. These meetings promote better understanding between the retail pharmacists, the hospital and the community.

The national average for the cost of drugs in a hospital has been computed to be approximately 5 per cent of the total cost per day of maintaining a patient. Our cost-per-patient day for drugs is less than 4 per cent. This low cost-per-patient day is made possible by our manufacturing and dispensing policy.

At the present time only two units of parenteral penicillin are being dispensed. We furnish vials containing one million units of soluble crystalline pencillin G sodium and ten dose vials of aqueous procaine penicillin G, containing three million units each. The price declines which occur so frequently can be taken advantage of when a minimum inventory is maintained and dead stock packages do not accumulate.

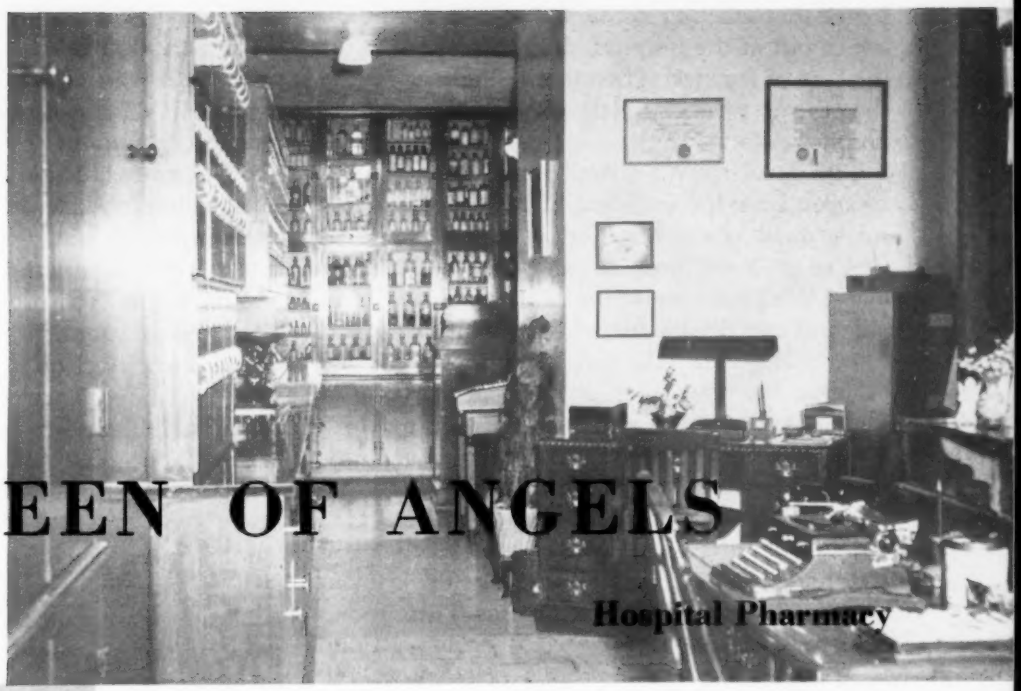
In 1931, the inventory of the pharmacy was $3,000. Present day inventory which was taken on July 1st of last year totaled slightly more than $25,000. With a yearly budget of $100,000 this means that we have a cash value turnover of our entire inventory every three months.

Plans for the future include a separate pharmacy unit for outpatient clinic dispensing, enlarged manufacturing facilities, increased bulk storage space and air-conditioning in our prescription dispensing and manufacturing units.

An achievement

in remodeling

and planning



QUEEN OF ANGELS

Hospital Pharmacy

By SISTER MARY JUNILLA, O.S.F.

BEFORE taking you on a tour of the pharmacy, I am going to tell you about this remarkable hospital with an extraordinary record in expansion. It will aid in visualizing the background for our Pharmacy Department.

Now, just a brief history. A many gabled, old-fashioned residence, reminiscent of the gay nineties was purchased in 1925. It still stands in the rear of the present building, where it served both as hospital and residence for the Sisters in those first difficult days until the first unit of the new building was completed. It is a far cry from this nucleus of 15 beds to the 502 beds and 103 bassinets within the space of twenty-two years. Additional wings were added to the first unit in 1933 and in 1937. The maternity section was completed in 1946.

Since the maternity opened, 12,956 mothers and 13,110 infants have passed through its doors. There were 146 infant sets of twins and 4 sets of triplets. There are finely appointed departments in the main unit. These include Pathology, Laboratory, X-ray, Surgery and the Orthopedic Department. This last occupies an entire floor complete with its own surgeries. Another floor is devoted to pediatrics. A fine medical library is nearing completion. An Outpatient Department was recently installed in temporary quarters until such time as a proper clinic building can be built. During the first few months of this year 4,261 patients were admitted through its service. It has a staff of 200 physicians and a small dispensary managed on a part-time service by a pharmacist.

So much for background. Now for one of the most important departments in any institution for the care of the ill. Some persons connected professionally with other departments, and perhaps even some physicians, will probably dispute this claim. In fact in diagrammatic schemes published concerning the functional set-up of departments, Surgery is given top place. They all

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SISTER MARY JUNILLA is chief pharmacist at Queen of Angels Hospital, Los Angeles, Calif. and treasurer of the American Society of Hospital Pharmacists.

forget that whether contained within the building or out of the hospital, drugs are essential for the care of the sick. Therefore a Pharmacy is the center cog around which the functions of the hospital revolve.

The department we now occupy is the fourth location since the founding of the hospital. With the growth phenomenal in pace for a western city, so grew our hospital, and with it the Pharmacy. With the completion of the maternity unit many of the departments in the main wing had to be enlarged to take care of an increased load on their facilities. Our department was one of these. Three adjoining rooms were requisitioned. Two were converted into stock rooms and one into a prescription room. You will find the Pharmacy in the east wing of the hospital with a large dispensing window (which closes by a roll door) opening into the hallway. The department consists of five interconnected rooms. Three rooms constitute administration and dispensing sections, the remaining two rooms are a prescription and compounding room, which contains a library, and a stockroom. Like most private hospitals on the west coast, the Pharmacy does not include a manufacturing laboratory in its set-up. Only the municipal and Veterans Administration hospitals have these facilities.

The original cabinets and prescription counter or bench were designed by myself. They are of Philippine mahogany with sectional compartments closed by glass doors, opening out instead of sliding. All additional cabinets match in design, with the exception of one wall section that follows Schwartz-like patterns, built over a bench section cabinet. All countertops are black formica with the exception of the prescription bench. This is finished with plate glass over green felt. Green is used as contrast for the dark woodwork,

Sister Junilla, front center, with members of the Pharmacy staff of Queen of Angels Hospital.

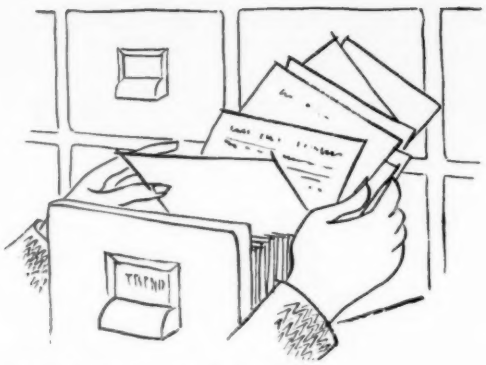
such as shelf bottles, files, venetian blinds and on the prescription bench, as already described. The prescription case or bench was designed for standing height. Many of the older designs cause the pharmacist to stand always in a stooping position, which is not wholesome.

The storeroom is divided into two sections—one containing island-shelving for pharmaceuticals and the other with large wall shelves for general stock, the latter containing the alcohol vault. The section supplied with a portable table is used as a work section in the stockroom. All woodwork is painted ivory color in the storeroom except a barrel platform which is painted grey. The flooring is terraza. All stock is indexed and inventoried by the Wheeldex system. Surplus and heavy stock is stored in the general warehouse.

Medicine is delivered to the floor stations via a large dumbwaiter from the Pharmacy. All medications are requisitioned for each individual patient. Each new order must be accompanied by the duplicate strip from the Physician's Order Chart, which is made or transferred onto the duplicate by attached carbon paper on the perforated duplicate sheet. The perforations are spaced to permit four orders to be written on a strip. Lines on the original sheet agree with the duplicate perforations. This system complies with the State law on drugs falling under the Dangerous Drug List, which requires a physician's written order. It avoids mistakes in copy made by nurses and encourages physicians to make their own written orders instead of insisting on the nurses acting as secretaries. They have learned that we do not accept orders unless they have written them (emergencies excepted). We do not accept verbal orders transmitted by nurses.

Requisitions are priced and filed in sorters according to the Multiform System of posting. A clerical employee does all the posting and transfers the posted sheets and tickets to the business office at intervals. Our entire staff consists of a chief pharmacist, assistant chief pharmacist, two pharmacy interns, a pharmacy helper, a clerical assistant, and one of our Sisters who is at present a student at the University of Southern California College of Pharmacy.

A *Pharmacy Bulletin* is edited once a month for the staff physicians' bulletin board. The chief pharmacist also sponsors an extracurricular program for the student nurses, which is presented once a month. This program is a medical-cultural type planned to bring special or specific material on a more personal basis, to the student nurse.



THERAPEUTIC TRENDS

New trends in medicine and pharmacy include
HEXAMETHONIUM IODIDE — PROMACETIN
UROKON — DIHYDRO-BETA-ERYTHROIDINE

HEXAMETHONIUM IODIDE

Hexamethonium iodide, a member of the homologous series of polymethylene-bistrimethylammonium compounds, has been found to have a profound effect on gastric secretion and motility and may prove beneficial in the treatment of peptic ulcer. Three members of this series have recently been investigated and all seem to act by impeding the transmission of nerve impulses but interestingly, there are striking differences in their point of action and in their effects. Thus the deca-compound blocks the neuromuscular function of striated muscle and consequently has a curare-like effect, while the penta-compound exerts its main action on the preganglionic sympathetic synapses and is an effective vasodilator. Hexamethonium iodide inhibits gastric secretion and motility but appears to have no curare-like action and no marked effect on blood pressure.

A report by Kay and Smith on the effect of hexamethonium iodide on gastric secretion and motility in ten patients appeared in the *Brit. Med. J.* 1:460 (February 25) 1950. The study shows that the drug when given intramuscularly inhibits the spontaneous secretion of hydrochloric acid. A single dose of 100 mg. produces achlorhydria for as long as three to four hours. It was found that three injections of the drug—given at 8 P.M., midnight and 4 A.M.—reduced the volume of night secretion in patients with ulcers to less than half and also greatly lowered the acidity. Repeated doses effect a substantial reduction in the volume and acidity of the night secretion. The drug was found also to have a marked inhibitory effect on the movements of the stomach. The four-hour period of inhibition after hexamethonium iodide is greater than has been observed after any other agent. The cessation of gastric contractions and tonus waves is as complete as that resulting from vagal section.

Hexamethonium iodide appears to have several advantages over other drugs with a similar pharmacological action. Its effect is more uniform, more potent, and of longer duration of action. It is relatively free from untoward side effects. Objective side effects included suffusion of the conjunctivae which may be observed within a few minutes after injection; and a slight fall in blood pressure and a slight increase in pulse rate which occured in two patients upon standing.

UROKON

Urokon is a new excretory pyelographic medium which has been reported to produce fewer side reactions, such as nausea, vomiting, arm pain or foreign taste, than the compounds most widely used at the present time. Chemically, Urokon is sodium 2,4,6-tri-iodo-3-acetylaminobenzoate and contains 65.8 per cent of iodine. Reporting the results of their investigations on this drug in the *University of Michigan Medical Bulletin.* **16**:37 (February) 1950, Nesbit and Lapides found that the intravenous administration of 25 cc of a 30 per cent solution of Urokon to 1,081 patients produced reactions in only 19 per cent; in contrast to 36 per cent of reactions caused by Neo-Iopax or 62 per cent by Diodrast. The quality of the pyelograms obtained with Urokon was as good as those seen with other media.

In humans, approximately 60 per cent of the iodine in 25 cc of a 50 per cent solution of Urokon is excreted in the urine within three hours. The body is completely cleared of the drug in 24 hours in the normal patient.

Animal studies showed that the kidney was the only organ to contain appreciable amounts of the drug fifteen minutes after intravenous injection. It is not absorbed by the gastrointestinal tract of the rat when given orally. In the rabbit, practically all of the Urokon is cleared from the blood in thirty minutes after intravenous injection and more than 90 per cent of the total injected amount of iodine is excreted in the urine in three hours.

Urokon is supplied for investigational purposes by the Mallinckrodt Chemical Works, St. Louis.

DIHYDRO-*BETA*-ERYTHROIDINE

A new drug with a curare-like action, dihydro-*beta*-erythroidine, appears to show promise as an adjuvant in the treatment of paralysis agitans.

The natural source of this drug is from a genus of trees and shrubs, *Erythrina* L. which is widely distributed over the tropics and subtropics. An alkaloid, erthyroidine, has been isolated from the seeds. The isomer *beta*-erythroidine was most readily obtained in the pure state and possessed greater curare-like properties. This alkaloid was first used clinically in 1935; however, it possessed the disadvantage of a very short duration of action. In 1944, a hydrogenated derivative, dihydro-*beta*-erythroidine was prepared which has been found to be six times as potent and to possess a much longer duration of action.

The effects of the administration of this drug orally to a series of 24 patients suffering from paralysis agitans has been reported by Shapiro and Baker *Am. J. Med.* 8:153 (February) 1950. The patients studied were classified into three main groups: those in which the drug was used alone; those in which the drug was used alone initially but in which subsequently one of the atropine derivatives was added; those in which both dihydro-*beta*-erythroidine and atropine derivatives were given concomitantly. The average dose of dihydro-*beta*-erythroidine administered was 200 mg. per day. When this drug was used alone it proved to have little effect upon the symtomatology. However, when used as an adjuvant to the atropine derivatives, there was a striking improvement in most cases in which rigidity was a feature. In order to evaluate the individual effects of the two medications, dihydro-*beta*-erythroidine was discontinued for varying periods of time while the atropine derivatives were continued unchanged. In all these cases the discontinuance of dihydro-*beta*-erythroidine for longer or shorter periods resulted in a definite recrudescence of symptomatology. The drug had little effect upon the tremor or upon the oculogyric crisis.

The toxic symptoms from the drug consisted primarily of gastrointestinal manifestations, visual disturbances and some dizziness. Although these symptoms appeared in eleven patients, they were for the most part mild and transitory and in only one case was the medication discontinued.

PROMACETIN

Promacetin, at one time referred to as internal antiseptic 307, is a sulfone closely related chemically to promin, diasone and sulfetrone. Its use in the treatment of leprosy has been investigated by Johansen and coworkers and reported in *Public Health Reports* 65:195 (Feb. 17) 1950.

Promacetin is sodium 4,4′-diaminodiphenylsulfone-2 acetylsulfonamide. It is a white crystalline compound soluble up to 3 per cent in water at room temperature.

Studies of the effects of Promacetin were made on 27 patients over a period of sixteen months. The drug was given orally at meal times in dosages beginning with 0.3 gram or 0.5 gram and slowly increasing by the same amount every two weeks until a maximum of 3 to 4 grams daily was reached. Among this group of 27 patients there were no severe acute toxic symptoms. In some patients there was a slight decrease in erythrocyte counts.

Objective clinical improvement of the skin and mucous membrane lesions of lepromatous leprosy followed the oral administration of Promacetin. The improvement was uniform and sustained. It was noted that apparently stationary residual lesions in patients previously treated with sulfones responded further with renewed clearing after the administration of Promacetin, suggesting that combined sulfone-Promacetin therapy may be desirable.

Promacetin is supplied for investigational purposes by Parke, Davis and Company, Detroit.

NEW ANALGESIC NU-2206

Results comparable to morphine sulfate in relieving postoperative pain in 406 patients have been reported for a new analgesic agent. Known as NU-2206 (3-hydroxy-N-methyl morphinan hydrobromide), this drug has been found to have desirable analgesic properties with an apparently more prolonged effect than that of morphine sulfate in equivalent dosage ranges. In the early studies, the dosage range was from three to six mg. as compared with 15 mg. of morphine. Side effects did not appear to be severe or frequent, and no withdrawal symptoms were observed in a limited study.

Clinical trials were carried out by a group of physicians in Iowa City and reported in *J. Lab. Clin. Med.*, 34:1758 (December) 1949. In a controlled study, patients were divided into fifteen operation categories so that subsequent statistical evaluation as to the amount of pain associated with various types of operative procedures could be compared. In each category alternate patients were given NU-2206 or morphine sulfate. In conclusion, the authors state that NU-2206 is as effective an analgesic as morphine, with no demonstrable increase in side actions. NU-2206 may cause addition and is controlled by the Harrison Narcotic Act.

NOTES AND SUGGESTIONS

Edited by GEORGE L. PHILLIPS, *University Hospital, Ann Arbor, Michigan*

PRELIMINARY REPORT ON PARENTERAL CONTAINERS

This report is directed primarily to the members of the Committee on Parenteral Containers of the American Society of Hospital Pharmacists, but it is hoped it may evoke interest and comment from the entire membership. This committee was set up at the Fifth Institute on Hospital Pharmacy in Chicago for the purpose of developing a bulk sterile fluid container and administration set which would be low in cost, yet equal in quality, to any on the current market.

Plans for such a container are now being developed at University Hospital in Ann Arbor, Mich. The bottle to be used initially will be that of the Baxter Laboratories of Morton Grove, Illinois, with consideration being given to obtaining our own mold from a glass manufacturer if interest and savings warrant. In any event, our bottle would probably be similar to Baxter's, such that the two bottles might be interchanged in hospital intravenous production lines. No favoritism was intended in choosing the Baxter bottle for this study. Our principal reasons were: (1) the widespread use of Baxter fluids would enable reclamation of bottles if desired, (2) the lip and neck size of the bottle was well suited for the stopper and closure we wished to use, and (3) the Baxter Laboratories, Inc. were extremely cooperative in assisting us with this study.

The stopper to be tried initially will be a three hole (all holes diaphragmed), plastic coated rubber stopper formerly used exclusively on the Baxter A.C.D. bottles prior to their introduction of the Fuso-Flow blood stopper. This stopper would be used with a glass vent tube and could be adapted for either parenteral fluids or blood administration. A vacuum will be drawn on all packages prior to autoclaving. The stopper will then be tightly sealed in the bottle using an Alseco aluminum foil seal which is obtainable from the Aluminum Seal Company, Inc., Richmond, Indiana. The bottle is then sterilized and the vacuum is retained.

Administration equipment consists of a drip tube for plunging through the diaphragmed stopper, a length of tubing, and a nylon needle adapter. Either line filtration or prefiltration may be employed when using this system for transfusions. Short crossover sets will serve as multiple or series units.

It is hoped that several sources for all component parts of this system may eventually be secured to insure continued delivery at lowest possible cost. Thus far, it appears that this will be so. As for example, we may obtain a plastic coated molded rubber stopper of our own specifications from several of the large rubber companies by paying an initial die fee.

As far as I know now, this container may be used with any type of filling equipment in current use.

Please bear in mind that this is a preliminary report and that your questions, comments, and suggestions will be most welcome. We hope to have this equipment in full operation in time to demonstrate at the Sixth Institute on Hospital Pharmacy, which will be held in Ann Arbor in June of this year.

Respectfully submitted,

GEORGE L. PHILLIPS, *Chairman*
Committee on Parenteral Containers

SODIUM *PARA*-AMINOSALICYLATE TABLETS

Gastritis resulting from the ingestion of large amounts of unneutralized PAS led to the introduction of its sodium salt. Sodium PAS lends itself to tableting very well. The following formula has been used successfully:

Sodium *Para*-Aminosalicylate	5710.0 Gm.
Methylcellulose (1500 cps) 2 per cent aqueous solution	Approx. 1500.0 cc.
Magnesium Stearate	28.5 Gm.
Purified Talc	62.1 Gm.

Granulate quite wet through a number 12 screen. After drying, reduce through a number 16 screen. Use a one-half inch die and punch to obtain beveled edge for ease in swallowing. Each finished tablet should weigh 0.58 Gm. and each tablet will then represent 0.5 Gm. of *para*-aminosalicylic acid.

OINTMENT TO CONTROL SEEPAGE

At the request of our Dermatology Department the following ointment was devised to control weeping or seeping types of dermatitis.

Dehydrated Glycerin	20.0 Gm.
Anhydrous Lanolin, to make	100.0 Gm.

Mix with as little exposure to moisture as possible and package in air-tight containers. The glycerin was dehydrated on an electric hotplate at 305 degrees F., with stirring, until no loss in weight occurred.

DANGER OF CENTRALIZED VACUUM FOR STERILE ROOM

In looking over various proposed plans for hospital pharmacy sterile rooms I have noted the inclusion of central vacuum outlets in several floor plans. If this central vacuum line includes the operating room and nursing units on the same line as the sterile solutions room, I believe it constitutes a dangerous practice. The danger of inadequate traps in handling highly contaminated drainage from suction sets in the various nursing units should preclude central vacuum usage on sterile equipment. If wall outlets for vacuum are desired, and they surely possess certain advantages, then by all means have a separate system for the sterile room only. The possibility of heavily contaminated material backing up into the vacuum line from empyema suction units must not be overlooked.

VOLUME TRENDS IN MEDICATIONS

The following table is an excerpt from a speech delivered by John E. McKeen, president of Chas. Pfizer & Co. and reprinted in part in the *Oil, Paint and Drug Reporter* 157:10 (March 6) 1950. The trends in dollar volume of the various types of medications are self evident and indicative of the reliance placed upon them in health care.

VITAMIN E EQUIVALENTS

Much biological and chemical work is being carried out with *d, alpha*-tocopherol and with mixed tocopherols prepared from vegetable oils. Yielding to continuing requests for biological equivalents of the various tocopherols and their esters, Distillation Products of Rochester, New York has furnished the following *approximate* equivalents. These equivalents are based on their own rat antisterility assays and they emphasize that these are approximate only. It is interesting to note that molecule for molecule, the tocopheryl esters are more active than their corresponding unesterified forms.

Amounts of Various Tocopherols Equivalent to One mg. of *d, Alpha*-Tocopherol

Tocopherol	Amount in mg.
Synthetic *Alpha*-Tocopherol	1.36
dl, Alpha-Tocopherol	1.36
d, Alpha-Tocopherol Acetate	0.68
dl, Alpha-Tocopherol Acetate	0.92

One mg. of *d, alpha*-tocopherol is equivalent to 0.92 International Units of vitamin E.

OINTMENT FOR RINGWORM OF SCALP

The following ointment has been recommended for treatment of all types of ringworm, especially that of the scalp.

Salicylic Acid	0.5 Gm.
Iodine	0.5 Gm.
Sulfur, precipitated	5.0 Gm.
Triethanolamine	6.0 Gm.
Zinc Undecylenate Powder	20.0 Gm.
Undecylenic Acid	5.0 Gm.
Washable Base	63.0 Gm.

Dissolve the iodine in the triethanolamine. Triturate the powders with a small amount of the washable base and finally combine all ingredients and mix until smooth. Mill if required.

Medical Trends in Dollar Volume

Medication	1929	1935	1939	1942	1947	1949
Acetysalicylic Acid	.....	.....	.....	$ 5,000,000	$ 6,000,000	$ 12,000,000	$15,000,000
Antibiotics	.....	.....	.....	.....	1,000,000	82,000,000	160,000,000
Antihistamines	.....	.....	.....	.....	.....	2,000,000	35,000,000
Arsenicals and bismuth Preparations	$ 3,000,000	$ 3,000,000	3,000,000	5,000,000	4,000,000	2,000,000
Barbiturates	8,000,000	6,000,000	9,000,000	18,000,000	26,000,000	30,000,000
Biologicals	7,000,000	8,000,000	9,000,000	20,000,000	23,000,000	29,000,000
Botanicals	15,000,000	13,000,000	16,000,000	20,000,000	40,000,000	50,000,000
Endocrines	.....	11,000,000	17,000,000	30,000,000	62,000,000	70,000,000
Sulphonamides	.....	.....	5,000,000	15,000,000	28,000,000	28,000,000
Vitamins	.....	14,000,000	23,000,000	50,000,000	133,000,000	150,000,000
All other	137,000,000	78,000,000	92,000,000	100,000,000	133,000,000	145,000,000
TOTAL	$170,000,000	$133,000,000	$179,000,000	$265,000,000	$545,000,000	$714,000,000

TIMELY DRUGS

ANTI-HISTAMINE TABLETS . . . is the name given to 25 mg. tablets of pyranisamine maleate available from Armour Laboratories. This preparation is indicated in the symptomatic treatment of urticaria, angioneurotic edema, allergic rhinitis, hay fever, allergic drug reactions, contact dermatitis, and certain other forms of allergy. The adult dose of Anti-Histamine tablets is 25 to 100 mg. three or four times a day. Children should be given one-third to one-half this dose. The tablets are available in vials of 25 or bottles of 100.

* * *

BEVIDOX CONCENTRATE SOLUTION . . . a preparation indicated in various types of macrocytic anemias, including nutritional anemia, sprue (tropical and non-tropical) and pernicious anemia is available from Abbott Laboratories. It is prepared by a fermentation process using a Streptomyces culture. Each cubic centimeter of sterile solution is equivalent to 30 micrograms of crystalline vitamin B_{12}. There are no reported contraindications when administered in therapeutic doses, and no untoward effects of an allergic nature have been observed. Owing to the relatively low content of solids, there is no pain after injection.

Bevidox Concentrate Solution is administered by the subcutaneous or intramuscular route. Each microgram of activity in Bevidox Concentrate is equivalent to 1 U.S.P. unit of standard liver extract. The suggested dosage in the treatment of pernicious anemia is 15 micrograms once or twice weekly until a maximum reticulocyte response is obtained. The maintenance dosage may be 15 to 30 micrograms every two to four weeks. It is available in 5 cc. and 10 cc. multiple dose vials.

* * *

CYTOBEX . . . is Parke, Davis' brand name for crystalline vitamin B_{12}, used in the treatment of anemias. It may be employed in place of liver extract in treatment of pernicious anemia, nutritional macrocytic anemia, tropical and non-tropical sprue, and megaloblastic anemia in infancy. Cytobex is especially indicated in those patients who are sensitive to liver extracts. Solutions may be injected either subcutaneously or intramuscularly. Dosage should be adjusted to the needs of the patient. Cytobex is supplied by Parke, Davis and Company, in 1 cc. ampules, each containing 15 micrograms of crystalline vitamin B_{12} dissolved in physiological saline solution. Ampuls are packed in boxes of 6.

* * *

DUOZINE . . . is a suspension of sulfadiazine and sulfamerazine designed to simplify the administration of combined sulfonamides to infants and small children. Each teaspoonful (5 cc.) contains sulfadiazine 0.15 Gm., sulfamerazine 0.15 Gm. and sodium citrate, U.S.P., 1.5 Gm. Duozine Suspension is indicated for the treatment of acute bacterial infections caused by organisms susceptible to the action of either of the two constituent drugs. The end sought is a therapeutic concentration of sulfonamide in the blood which should range between 10 and 15 milligrams per 100 cc. Dosages vary according to the age of the patient and the severity of the infection. Duozine is available in 1 pint bottles from Abbott Laboratories.

* * *

MECHLORETHAMINE HYDROCHLORIDE [methyl-bis-(β-chloroethyl)-amine hydrochloride] . . . is a nitrogen mustard preparation recently made available by Merck and Co., Inc. Clinical investigations carried out over a period of several years indicate its usefulness as a palliative agent in certain neoplastic diseases, particularly those of the lymphoid and hemopoietic systems. In suitable cases, its use has been found to produce a temporary decrease in the size of diseased tissues and organs, alleviation of symptoms, weight gain, and improvement in appetite and sense of well-being. It should be noted that the studies show that nitrogen mustard does not cure neoplastic disease but does frequently produce regression or remission of the process for varying periods of time.

The effects of Mechlorethamine Hydrochloride resemble in many ways those produced by total body exposure to x-rays and, from a superficial point of view, the therapeutic results of the administration of this drug are comparable to those of total body irradiation. It appears, however, that at maximum tolerated doses Mechlorethamine can be administered more safely, more economically, and more effectively than total body irradiation. Better dosage control is based on the establishment of fairly

definite tolerated doses of the drug for certain clinical situations, and the observation that tissues damaged by it appear to recover more rapidly than those with equivalent injury from x-rays.

The proper use of Mechlorethamine requires an accurate histologic diagnosis of the disease and a knowledge of its natural course; an understanding of the hazards to be encountered in the use of Mechlorethamine and the therapeutic effects to be expected; and the exercise of careful clinical judgment in the selection of this drug for the treatment of a given patient. If there is no clear indication for it, Mechlorethamine should not be used. The drug is not suggested as a substitute for accepted forms of x-ray therapy, but it may be employed in situations where the conventional application of x-ray therapy is ineffective or unavailable, or where chemotherapy will simplify the management of the disease without therapeutic disadvantage to the patient.

Clinical experience to date indicates use of Mechlorethamine Hydrochloride in the following conditions: Hodgkin's disease, lymphosarcoma, chronic lymphatic leukemia, chronic myelogenous leukemia, polycythemia vera, mycosis fungoides, multiple myeloma, carcinoma of the lung and miscellaneous types of malignant tumor. The dosage depends largely on the clinical situation and the therapeutic response. Mechlorethamine is administered intravenously and is very promptly removed from the blood stream, reacting quickly with the tissues.

Mechlorethamine Hydrochloride is supplied in treatment sets of four 20 cc. rubber-stoppered vials, each vial containing 10 mg. of Mechlorethamine Hydrochloride triturated with 90 mg. of anhydrous sodium chloride. (The sodium chloride has been added as an extender to facilitate subdivision of the active material into the small amount contained in each vial.) The solution should be freshly prepared before each injection.

Since nitrogen mustard, both as a powder and a solution, is a vesicant, proper precaution should be taken in handling it. Also, the possibility of unpleasant side reactions should be noted.

* * *

ORETON (Testosterone propionate in sesame oil) . . . has recently been made available in a new dosage form (100 mg. per cc.) by Schering Corporation. The high dosage form is intended especially as a convenient form for intramuscular administration of large amounts of the hormone where indicated. Oreton in the high dosage form may be indicated in female breast carcinoma, certain types of arthritis, and other conditions in both male and female where high doses of androgens are required. Oreton is available in multiple dose vials of 10 cc., containing 100 mg. per cc.

* * *

PERCORTEN . . . (desoxycorticosterone acetate) . . . is now available in the form of Linguets from Ciba Pharmaceutical Products, Inc., making it possible to avoid the necessity of injections in long continued maintenance therapy. Percorten Linguets, containing 2 mg. of Percorten, are held between the gum and cheek or under the tongue to permit slow absorption of the hormone through the oral mucosa directly into the systemic circulation.

Percorten is recommended in adrenocortical deficiencies such as occur in Addison's disease, certain forms of Simmonds' disease and orthostatic hypotension. It promptly decreases sodium and chloride excretion, increases potassium excretion, raises the plasma volume, produces a slow rise in blood pressure and gain in body weight with improved appetite and strength. Careful dietary adjustment of the salt intake is necessary during therapy. Percorten Linguets are available in bottles of 30 and 100.

* * *

PRENOLON . . . is Schering's brand name for pregnenolone, a new preparation for use in the treatment of rheumatoid arthritic patients. Its use has resulted in cases of increased joint mobility, less pain, greater endurance and heightened sense of well-being, although individual responses to treatment have varied greatly. No toxic effects have been reported on either oral or parenteral administration. Definite improvement has been apparent in a significant percentage of patients suffering from rheumatoid arthritis, ankylosing spondylarthritis (Marie-Strümpell) and other collagen diseases.

No definite dosage form has been established because of the variation in the response of individual patients. For this reason Prenolon is furnished in two forms, (1) in an aqueous suspension and (2) as the acetate in an oil solution.

The dosage range appears to lie between 50 and 300 mg. daily administered intramuscularly, the average patient requiring dosages within the upper limits to achieve the best response. If the patient shows no favorable response with 300 mg. daily for thirty days, Prenolon should be discontinued. Should the response be favorable in this length of time, then it is suggested that the dose be gradually reduced over the next thirty days until 100 mg. are being given every other day. Further therapy should then depend upon the response and the objective should be the determination of the smallest dose per week which

will maintain the benefit experienced by the patient.

Prenolon aqueous suspension is available in 10 cc. multiple dose vials containing 100 mg. per cc.; Prenolon Acetate dissolved in sesame oil 75% with benzyl benzoate 25%, is available in 10 cc. multiple dose vials containing 50 mg. per cc.

Prenolon (pregnenolone) should not be confused with the orally effective progestin, pregneninolone (Pranone).

* * *

RUBRAFOLIN . . . is a combination of vitamin B_{12} (Rubramin-Squibb) and folic acid now available for oral treatment of all common types of anemias of known cause. Available from E. R. Squibb and Sons, Rubrafolin administered orally, is said to be as effective as injections of the various preparations being used in the treatment of anemias. Heretofore, it was known that large oral doses of vitamin B_{12} were effective in bringing about remission of the symptoms of the disease in many cases; however, in combination with folic acid, vitamin B_{12} has been effective in much smaller doses.

Patients with severe neurologic changes, severe gastrointestinal disturbances, or severe anemia, especially when pernicious anemia is present, should not be treated with Rubrafolin. Patients such as these may respond best to B_{12} parenterally in the early stages of therapy.

* * *

SULESTREX PIPERAZINE (Piperazine Estrone Sulfate) . . . is a synthetic stable water-soluble form of estrone for oral administration now available from Abbott Laboratories. It provides conjugated natural estrone in a purified form that is odorless and practically tasteless. It does not leave any unpleasant aftertaste and will not taint the breath. Each round, white, uncoated tablet contains 1.5 mg. of Sulestrex Piperazine, equivalent to 1.25 mg. sodium estrone sulfate. Indicated in menopausal syndrome, most cases can be controlled with 1.5 mg. daily, but some patients may require as much as 4.5 mg. daily. For postmenopausal conditions, 1.5 to 4.5 mg. daily is adequate for most patients. Sulestrex Piperazine is available in 0.75 mg. tablets in bottles of 100, and 1.5 mg. tablets in bottles of 25 and 100.

* * *

ELIXIR SYNDROX HYDROCHLORIDE . . . is a new dosage form of methamphetamine hydrochloride available from McNeil Laboratories. It contains 20 mg. of methamphetamine hydrochloride per 30 cc. Elixir Syndrox is indicated in mild depressions, obesity, narcolepsy, and as an adjunct in the treatment of acute and chronic alcoholism.

TRIPLE SULFAS TABLETS . . . containing sulfadiazine, sulfamethazine and sulfamerazine, are available in bottles of 100 and 1000 from Lederle Laboratories. Clinical reports have shown that the combination of sulfonamides is more effective and at the same time less toxic than when a single one of the three drugs is used alone. Triple Sulfas Tablets are designed for use in the treatment of a wide variety of bacterial infections.

* * *

VALOCTIN . . . a combination of the antispasmodic, Octin, and the non-barbiturate sedative, Bromural, is used for relaxation of spastic disorders and control of the accompanying nervous tension. It is indicated for the relief of pain and discomfort associated with spasm in ureteral colic, hypertonicity of the bladder, cholecystitis, spastic colon, peptic ulcer and pylorospasm. It has proved helpful in the spastic type of dysmenorrhea and in tension and migraine headaches. Valoctin tablets (5 grain) are available in tubes of 15 and in bottles of 100 and 500 from Bilhuber-Knoll Corporation.

* * *

ZYMATINIC DROPS . . . is Upjohn's name for a preparation of iron and liver supplemented with folic acid and other members of the B-vitamin group. It is designed primarily for treatment of anemias in infants and children. Zymatinic is available in 60 cc. calibrated dropper bottles and the dosage for children is 1 to 2 cc. daily either plain or mixed with orange juice. For adults, the dosage is 1 to 5 cc. daily, plain or mixed with fruit juice.

Texas Society Affiliates

The Texas Society of Hospital Pharmacists has requested affiliation with the national Society. At a meeting held in conjunction with the Texas Hospital Association at Galveston on March 7, the group approved a Constitution and By-laws and elected officers for the current year. Mr. Lewis S. Smith of Baylor University Hospital in Dallas, was elected president and Miss Adela Schneider of the Missouri Pacific Hospital in Houston, was elected secretary. On applying for affiliation with the national organization, the Texas Society submitted a list of 23 hospital pharmacists who are members of the American Pharmaceutical Association and the American Society of Hospital Pharmacists as well as the state group.

Plans are being made to hold a seminar for hospital pharmacists at the University of Texas in Austin on May 22 and 23, during which time the annual meeting of the Texas Society will be held.

Beginning a new section of high interest and importance to the hospital pharmacist, this introductory article will be followed by others discussing various phases of hospital pharmacy management

BUSINESS ADMINISTRATION

IN HOSPITAL PHARMACY

Edited by ANNA D. THIEL, Jackson Memorial Hospital, Miami, Fla.

The close interrelationship which pharmacy has attained with medical practice through the development of science, today commands universal recognition.

The first mercy services to humanity were the outgrowth of religion rather than of medicine, according to historians. Continued service has endeared the pharmacist to the hearts of the community, resulting in his affectionate nick-name "The Corner Druggist."

In the advance of civilization, progress toward the ideal hospital steadily has been made. In the improved methods now employed in providing for care of patients the best business administration has become imperative.

It is logical that pharmacy should have built for itself an important place in the field of hospital care by becoming "the most extensively used of therapeutic facilities of the hospital," according to Malcolm T. McEachern, M.D., Associate Director of the American College of Surgeons, in his book, *Hospital Organization and Management.* "Frequently the Pharmacy is not organized or managed as its importance deserves," Dr. McEachern believes.

Without the knowledge and efficiency of the well trained hospital pharmacist, backed by proper departmental business experience, the patient entering the door of the hospital would not receive the expert service that medical care now requires.

Excellent public relations are a result of good business administration plus courtesy. The patient, a member of the professional staff, a stranger or a visitor must feel welcome, pleased, and satisfied with the service received. Expressions of approval and recommendations of the hospital and its coordinated services will follow.

Hospitals now control the management of the largest public welfare services available to the citizens of this country, ranking second only to churches and schools.

The Pharmacy is a source of steady income. Financially, pharmacy departments in hospitals have been placing second only to food in their budget estimates. In a recent survey of 29 Blue Cross plans excluding room and board, pharmacy charges represented 12 per cent of the total, made by all other income producing departments.

For maximum efficiency, combined bookkeeping systems must reflect the dispensing of all drugs and chemicals to the various services within the hospital. Based on these records are the monthly reports to the director of the hospital. These reports are necessary and may be attained only through efficient business administration, coordinating every record kept in the Pharmacy.

Regardless of the method used or complexity of the procedure to achieve the desired result, there is a human relation factor in pharmacy that is the very heart beat of the hospital organization in its entirety.

Hospital pharmacy administration must be perfectly correlated to show the volume of work of the department and expense accrued. Efficient and economical management of every phase of the work involved is of primary importance. Regardless of size or classification of the hospital served by the pharmacy, every employee, whether in a menial or professional capacity, is an important cog in the wheel—a vital factor in the efficient care of the patient.

Proper business management must concern itself with five basic principles:

Departmental Organization. The Pharmacy must have a competent director, whose duties are well defined, and whose superior qualifications include a kindly, cooperative attitude and a nice, clean, wholesome disposition—all of these in addition to the established educational requirements must make up the qualifications of this business manager.

Coordination. The work of the personnel must be planned to render service according to the demands of every department in the entire hospital and its outpatient services. Serious consideration should be given to methods already in use, with a view to their improvement wherever advantageous changes are indicated.

Cooperation. Unlike banking, human lives are being handled, therefore a helpful spirit of loyalty and cooperation must be uppermost with every individual on the staff of the pharmacy.

Efficiency. Many hospitals now provide a pharmacy internship program, for training pharmacists in more efficient performance of their profession in this specialized field. Formerly we fitted the job to the available employee. Today's educational facilities provide personnel competently trained for the job.

Economy. The maximum in production with a minimum of effort is a *must* in the modern business world. A minimum of loss in both material and manpower is always reflected in larger overall profits for the pharmacy.

Service. In order that the sick may receive adequate medical service the pharmacy must provide efficient means for manufacturing, dispensing and delivering drugs to the patient. The equipment necessary for use in all these services today require special study in order to produce the best results. Every drug must be dispensed as the result of a written request either by prescription, voucher, or routine list. Records of each procedure must be properly recorded and filed in order to accomplish necessary bookkeeping results.

The activities of each day for every section of the pharmacy must be summarized and totals carefully recorded. At the end of the month reports should be compiled, showing business handled in various sections where records are kept. These totals must be assembled on one card, thus showing the monthly report in a concise manner. Whenever a conference is attended, one file card with twelve months totals of the aggregate knowledge will prove more than words the increase or decrease of business.

Records should include the following:

1. Drugs Purchased. Stock sheets are invaluable to show stock turnover. They determine amounts purchased, cost of items and the date. Inventories of stock must be periodically checked and filed to promote efficient buying. A valuable asset is a pharmacy storeroom for bulk items. The storeroom, if provided, should be adjacent to the main pharmacy.

2. Manufacturing. Card records of manufactured items must show formula, cost of production, and savings involved.

3. Prescriptions. Number of prescriptions dispensed, cost of materials used, cost of indigent service and cash received must be recorded.

4. Ward Floor Orders. Number of routine orders filled, number of special orders to patients with itemized costs are required according to individual accounting systems.

5. Prepackaging. A saving in both time and materials may be effected through prepackaging of drugs for routine stocks to floors. This work may be accomplished by careful supervision and proper records. A formulary will permit pre-packaging of drugs used in outpatient clinics as well as floor routine stocks.

6. Therapeutics Committee Reports. No hospital should be without a formulary to be used as a guide for the physician and not a law. One of the most important duties of the chief pharmacist is acting as secretary for the Therapeutics Committee appointed by the staff.

Reports consisting of changes in the hospital formulary must be filed and available for information to the medical staff.

7. Inspections. Reports of periodic inspections of floor drug stocks, including narcotics, must be made and records kept and filed.

8. Conventions. Detailed records and reports of conventions attended and hospitals visited should be filed for use in preparation of "suggestions for improvement" reports.

9. Narcotics and Barbiturates. A valuable keynote for accurate dispensing in a hospital is the forms on which prescriptions, vouchers, and requisitions are requested from the pharmacy. This is particularly true of narcotics for which legal requirements demand safe storage. Routine checking by government inspectors is customary. A perpetual inventory is preferred in order to keep narcotic records in proper order.

The overall picture of most hospitals is not one of producing a profit. Administrators welcome expert business management in the pharmacy department which shows "profits in a non-profit institution." Concrete information in the reports resulting from available records, showing services rendered will reflect efficient business management. The profit resulting from good business methods should be comparable to that of a retail pharmacy doing the same volume of business and providing similar professional service.

A hospital administrator has a logical reason for seeking a well trained, professional person to direct the hospital pharmacy, in order that the ultimate in profits to which the institution is entitled may be obtained.

The income and cost control in the hospital pharmacy, which will be discussed in a future paper, shows methods of departmental policies and evaluation of present day systems.

Attention
1950 Pharmacy Graduates

The rapid expansion of hospital facilities with greater emphasis on superior pharmaceutical service points the way to greater opportunities for the recent graduate

For the information of those who will be graduated this June, we are publishing a list of hospitals offering training programs in hospital pharmacy. More and more pharmacy students are becoming interested in entering this specialty of the public health profession because it affords an opportunity to apply in practice a maximum amount of the material presented in the standard curriculum and to utilize the knowledge of the profession of pharmacy.

If you are interested in this aspect of pharmacy or are undecided about your future in the pharmaceutical profession, we would recommend that you investigate the opportunities offered by these institutions.

The first group includes those institutions which offer an academic program leading to the Master of Science degree, usually with a concurrent internship in an affiliated hospital. The second group includes those hospitals which offer non-academic internship training programs both of a formal and informal type. By formal internship it is meant that the course is officially announced and offers a detailed period of on-the-job training combined with a formal series of lectures or conferences given in the pharmacy.

INSTITUTIONS OFFERING ACADEMIC WORK IN HOSPITAL PHARMACY

Institution	Cooperating Hospital	Duration Class Work (Months)	Duration Internship (Months)	Remuneration
University of Maryland School of Pharmacy	Johns Hopkins Hospital	half time 16	half time 16	$100.00 per month, no maintenance, 25% reduction in tuition and fees
University of Illinois School of Pharmacy	Research and Educational Hospitals of the Univ. of Illinois	9	12	$600.00 per year plus maintenance and exemption from tuition and fees
University of Michigan School of Pharmacy	University Hospital	half time 16	half time 16	$100.00 per month, no maintenance, tuition fee $100.00 per year for residents, $200.00 for non-residents
Philadelphia College of Pharmacy and Science	Jefferson Medical College Hospital	half time 16	half time 16	$800.00 per year plus full maintenance. Tuition $200.00 per year
Purdue University School of Pharmacy	None	9	None	Teaching Fellowship $1680.00 per year
University of California School of Pharmacy	University of California Hospital	half time 16	half time 16	$300.00 plus partial maintenance
State University of Iowa College of Pharmacy	State University of Iowa Hospitals	half time 16	half time 16	$1200.00 per year
University of Wisconsin School of Pharmacy	University of Wisconsin Hospital	half time 16	half time 16	Teaching assistantships and internships at approx. $90.00 per month

Name of Hospital Address Chief Pharmacist	Remunerations	Period of Training	Formal Informal
Duke University Hospital Durham, N.C. I. T. Reamer	Maintenance and $1800.00 per year	1 Yr.	F
Huron Road Hospital Cleveland, Ohio Gertrude Horsch	Full maintenance plus salary	1 or 2 Yrs.	F
St. Luke's Hospital Cleveland, Ohio Evlyn Gray Scott	Maintenance, hospital insurance & $50.00 per month	1 Yr.	F
Mercy Hospital Toledo, Ohio Sister Mary John	$1.00 per hour on duty. Time allowed for college work if desired	1 or 2 Yrs.	F
Freedmen's Hospital Washington, D.C. John S. Mitchell	Cash $100.00 per month. Small deduction for maintenance	1 Yr.	F
Queen of Angels Hospital Los Angeles, Calif. Sister M. Junilla	$1.30 per hour. 40 hours per week	1 Yr.	I
Grace-New Haven Community Hospital New Haven, Conn. John Zugich	$38.00 per week	1 Yr.	I
Evangelical Deaconess Hospital Detroit, Michigan Jane Rogan	75c per hour	1 Yr.	I
Receiving Hospital Detroit, Michigan Paul Cole	$50.00 per month	1 Yr.	I
Saginaw General Hospital Saginaw, Michigan K. C. Anderson	Open	1 Yr.	I
Missouri Pacific Hospital St. Louis, Mo. F. M. Rudi	$75.00 per month	2 Yr.	I
The Mercer Hospital Trenton, N.J. E. Friedman	75c per hour	1 Yr.	I
St. Mary's Hospital Brooklyn, N.Y. Sister Mary Ethel-dreda	Voluntary service; full maintenance	1 Yr.	I
St. Catherine's Hospital Brooklyn, N.Y. Sister M. Rose Columbia	.....	....	I
Watts Hospital Durham, N.C. Hunter L. Kelly	$50.00 per month plus maintenance	1 Yr.	I
Rex Hospital Raleigh, N.C. H. G. Price	$150.00 per month plus maintenance	1 Yr.	I
N. C. Baptist Hospital Winston-Salem, N.C. E. W. Rollins	$150.00 per month plus maintenance	1 Yr.	I
St. Joseph's Hospital Milwaukee, Wisc. Sister M. Agnese	Prevailing hospital pharmacy wage	1 or 2 Yrs. Females only	I
Mercy Hospital Baltimore, Md. Sister M. Carmel	.....	....	I
Mercy Hospital Oshkosh, Wisc. Sister M. Emmelia	.....	1 Yr. Sisters only	I
St. Joseph's Hospital St. Paul, Minn. Sister Alice	.....	1 Yr.	I
The Reading Hospital Reading, Pa. Vance Brumbaugh	$130.00 per month	6 or 12 Months	I
St. Elizabeth Hospital Elizabeth, N.J. Sister Marion	$150.00 per month	6 Mos. Sisters 12 Mos.	I

ACADEMIC INTERNSHIPS

Internships in Pharmacy
The Johns Hopkins Hospital

The Johns Hopkins Hospital, in cooperation with the Graduate School and the School of Pharmacy of the University of Maryland, announces that internships in pharmacy are open to a number of 1950 or other recent graduates of recognized schools of pharmacy. Appointments are for a period of twenty-two months beginning September 1, 1950. During twenty months, interns devote one-half time to hospital pharmacy training and one-half time to graduate study. Full time training in the hospital pharmacy is required for two months during the summer of 1951. Four weeks of vacation are allowed during the term of the appointment. Upon satisfactory completion of the internship and the course of study, Master of Science degrees are conferred by the University of Maryland and Certificates of Internship are awarded by The Johns Hopkins Hospital.

An allowance of $100 per month is provided by the hospital except during the two month period of full time training when the stipend is $150 monthly. The University of Maryland makes a reduction of 25% in tuition fees. Complete information regarding fees and curricula appears in the catalog of the School of Pharmacy, copies of which may be secured by sending requests to the School of Pharmacy, University of Maryland, 32 South Greene Street, Baltimore 1, Maryland.

Interns are required to rent rooms at the hospital. Meals may be purchased for a nominal sum in the hospital dining rooms.

Opportunity is offered for well-rounded practical experience in hospital pharmacy administration, pharmaceutical manufacturing, dispensing, and in the preparation of sterile solutions and other sterile products.

Applicants should submit a statement giving full details as to date and place of birth, citizenship, marital status, education and pharmaceutical experience together with a small, recent photograph. An official transcript of the applicant's college record is required. The applicant should ask the dean of his college to write to the Director giving his estimate of the applicant's personality and fitness.

Applications for admission to this joint program should be forwarded to Edwin L. Crosby, M.D., director, The Johns Hopkins Hospital, Baltimore 5, Maryland not later than April 1, and appointments will be announced on or before May 15, 1950.

Philadelphia Colleges Renew Offer of Academic Internship in Hospital Pharmacy

The Philadelphia College of Pharmacy and Science, the Jefferson Medical College of Philadelphia, and the Jefferson Medical College Hospital again announce a cooperative program of graduate study and internship in hospital pharmacy.

Applicants must possess the Bachelor of Science in Pharmacy degree and possess grades acceptable to the Graduate Committee. Combined instruction and internship will be for a period of approximately twenty-one months, with appointments beginning on August 28, 1950 and running through June 30, 1952. Upon satisfactory completion of this period of study and training, students will be awarded the degree of Master of Science in Pharmacy, a certificate of internship, and will be certified as competent to assume charge of a hospital pharmacy.

The student will receive lecture and laboratory instruction at both the Philadelphia College of Pharmacy and Science and the Jefferson Medical College in such graduate level courses as Hospital Pharmacy Administration, Seminar, and Survey; Manufacturing Pharmacy; Pharmacology; and Biochemistry, and will be allowed certain electives. He will major in Hospital Pharmacy with a recommended minor in Pharmacology. He will be required to pursue supervised research studies at these institutions.

The student will be encouraged to attend one of the annual hospital pharmacy institutes and the annual convention of the American Society of Hospital Pharmacists. He will be required to attend various pharmaceutical and medical meetings held in the Philadelphia area. His work will be scheduled so as to permit access to the several staff conferences held at the Jefferson Medical Center. He will attend the regular conferences of the Pharmacy staff.

The student will receive the equivalent of a twelve month internship at the Jefferson Medical College Hospital, under supervision of Herbert L. Flack, chief pharmacist, receiving instruction in the several divisions of the Pharmacy, to provide complete and well-rounded experience in the functioning of the modern hospital pharmacy. He will have the opportunity to serve as an observer in the several hospital departments with which the Pharmacy has contact, so that upon completion, he should be familiar with hospital organization and with the relationship of the pharmacy to the medical staff and to over-all hospital activities. He will assist in the preparation and presentation of lectures in pharmacology to student nurses.

An unusual feature of the instruction in hospital pharmacy is the course, Hospital Pharmacy Survey, in which the interns, under supervision of the chief pharmacist, make field trips to visit hospital pharmacies and manufacturing concerns whose products and processes are pertinent to the subject of hospital pharmacy. Following each trip, a critical report of the observations of the student is required. Thus the interns have the opportunity to see pharmacies of all sizes and types in action. Another feature of this Survey, has been to allow the intern to work for periods of several days in some of the outstanding hospital pharmacies.

The tuition and fees approximate $250 each year for this program. Complete maintenance will be furnished by the hospital and an allowance of $50.00 per month will be paid each student during the academic year. This stipend will be increased to $100.00 per month during the summer months. A one-month vacation period will be allowed if requested.

All candidates wishing to make application, or de-

siring further information for graduate study in hospital pharmacy, should write to the Secretary of the Graduate Committee, Philadelphia College of Pharmacy and Science, Philadelphia 4, Pennsylvania, for the necessary application form. This form, together with a transcript and three letters of recommendation should be returned not later than June 15, 1950. Appointments will be announced about July 1, 1950.

CURRENT LITERATURE

Edited by SISTER MARY ETHELDREDA, *St. Mary's Hospital, Brooklyn, N.Y.*

AMERICAN PROFESSIONAL PHARMACIST

FEBRUARY, 1950—"Reciprocal Relationships Between Hospital Pharmacists and Manufacturing Firms or Their Representatives" by Parke Richards, Jr. A discussion of misunderstandings which may arise in the contacts of pharmaceutical representatives and hospital pharmacists.

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FEBRUARY, 1950—"Processing Vial." Describes two pieces of equipment which may be used to process narrow necked vials.

page 161

MARCH, 1950—"Teaching Pharmacology To Student Nurses" by Sister Maria Lucia, B.S. Suggestions for teaching pharmacology to student nurses are outlined along with specific notes on screening and correlating drugs, aids for the student nurse, case study charts, texts and notes, use of motion pictures, examinations, model medicine cabinet, teaching bulk I. V. preparations.

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HOSPITALS

FEBRUARY, 1950—"The Technical Aspects of a Hospital's Departments." A discussion by eleven authorities on specific departments of a hospital. A symposium presented originally at the American Hospital Association Convention in Cleveland in the autumn of 1949. The pharmacy department is discussed by C. C. Hillman, M.D., Director, Jackson Memorial Hospital, Miami.

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FEBRUARY, 1950—"Reference Guide—A Review of Bibliographical Sources." Hospital pharmacists will find the lists of journals, books and monographs for hospital administrators helpful when references on hospital procedures, etc. are needed.

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HOSPITAL MANAGEMENT

FEBRUARY, 1950—"Pharmaceutical Exhibits in the Hospital and Some Considerations Involved" by Kenneth C. Crain. A broad presentation of various aspects to be considered in the permitting of exhibits in hospitals.

page 76

"The Need for a Hospital Formulary" by Meyer J. Gill, associate director, Beth Israel Hospital, New York City. An alert administrator recognizes the economical and clinical advantages of an up to date hospital formulary.

page 78

MARCH, 1950—"The Basic Role of Drugs in Modern Therapy" by J. M. Hayman, M.D. A paper presented to the American Pharmaceutical Manufacturers Association meeting in New York City, November 29, 1949. Reviews drugs in therapy and problems facing pharmacy today.

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MODERN HOSPITAL

FEBRUARY, 1950—"The Pharmacist Strives for Economy" by Ida Guber. Describes direct and indirect methods of economizing in a hospital pharmacy.

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MARCH, 1950—"Small Hospitals as Centers of Medical Education" by John T. Morrison, M.D. A Pharmacy Committee's reports of investigations of local uses of newer drugs may function as a method of drug control in small hospitals.

page 102

MARCH, 1950—"Is Boric Acid Harmless" by C. C. Pfeiffer. A thorough presentation of the effects of overdosage of boron, the methods of elimination, acute toxicity, absorption through intact and abraded tissue, symptoms of intoxication and mortality rate.

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the Veterans Administration

PHARMACIST

Edited by EDDIE WOLFE, *Mt. Alto Veterans Hospital, Washington, D.C.*

This is the second of a series of three articles describing operations of the three sections of Pharmacy Division, Department of Medicine and Surgery, Veterans Administration Central Office, Washington, D.C.

PHARMACY TECHNICAL SECTION IN VETERANS ADMINISTRATION

JOHN M. GOOCH

The Technical Section receives and reviews requests for new drugs from field stations and is responsible for making recommendations relative to their use in Veterans Administration activities. Information on new drug therapy is developed and disseminated. Pertinent pharmacological data is developed on drugs that are in the clinical stage of evaluation. Liaison is maintained with other governmental and non-governmental agencies. The Technical Section also shares in administering the over-all pharmacy program through supervisory visits to Veterans Administration pharmacies.

The Veterans Administration encourages medical, surgical and dental personnel to avail itself of the most modern therapeutically acceptable advances in the pharmaceutical field. Physicians and dentists are urged to inform Central Office of drugs which warrant consideration for addition to Veterans Administration approved drug lists. Any drug available in interstate commerce may be suggested for consideration. Therapeutic acceptability and relative importance in the field of new drug therapy are two factors considered when a significant number of requests for a new drug have been received. Upon approval, necessary action is initiated to have the new drug made available either on a decentralized contract or as a standard depot stock item.

Accumulated clinical data on drugs which are in the clinical stage of evaluation is reviewed and compiled for the information of the Central Office Committee on Therapeutic Agents. Study of professional publications, research papers and reports of studies by research divisions of manufacturers are several sources used in compiling information necessary for evaluating these drugs. Continuing efforts are made to maintain familiarity with this phase of pharmaceutical development so that information concerning new drug therapy and the drugs, when deemed advisable, may be available to the concerned service.

Liaison is maintained with the Food and Drug Administration, National Research Council, Council of Pharmacy and Chemistry of the American Medical Association, American Pharmaceutical Association, Public Health Service, Research Division of Drug Manufacturers, and the Research and Education Division of the Veterans Administration. This liaison is maintained for the purpose of evaluating new and revised developments in the field of pharmacy. This information is used in the development of procedures, technics, and standards.

In addition to directing the functions of the Technical Section described in the foregoing paragraphs, the chief of this section serves as supervisor and consultant to pharmacists in Veterans Administration activities. Supervisory and consultant responsibilities involve visits to pharmacies to offer any desired assistance and to insure compliance with established policies and procedures. Studies are made to plan corrective action for improved pharmacy service. Managers and professional personnel are contacted to resolve problems affecting their respective services.

MR. JOHN M. GOOCH is chief of the Pharmacy Technical Section, Pharmacy Division, Washington, D.C. He entered government service as chief pharmacist at the San Diego, California, Regional Office, and, prior to coming to Central Office, was chief pharmacist at the Veterans Administration Center, Los Angeles, California. He attended the University of Washington at Seattle, and was graduated with a Bachelor of Science Degree in Pharmacy in 1930. His Army service included duty with the 140th Station Hospital and the 61st General Hospital, both in this country and overseas.

as the president sees it

HERBERT L. FLACK
Jefferson Hospital, Philadelphia

This is the last of my messages to the membership. As I look forward to convention time and my opportunity to turn the gavel over to Tom Reamer, I regret that it was not possible to accomplish a little more this year than I did. To Mr. Reamer, I must therefore bequeath several projects that were not completed, and I present many projects that were never even begun. I hope when Tom's year is completed, he will have been able to report much better progress than I.

WHAT PROGRESS THIS YEAR

We really did accomplish a few important things this year, despite the fact that we should have completed many more. Now when I say "we," I mean you and I—our Society. Whether it be a few of us or many of us, we are all working together to achieve the aims of our Society, as expressed in the constitution. I hope that through the medium of these messages to the membership, we are closer together in thought, word, and deed and in cooperation. I hope that through our activities, we (the Society —you and I) are richer and hospital pharmacy is a more desirable professional specialty, just through our deeds this year, just because you and I felt the desire to spend a few extra hours as a contribution to our practice.

We were privileged to hold an Executive Committee meeting and a Policy Committee meeting. Our Executive Committee met with the Council of the American Pharmaceutical Association in the first of what we hope to be yearly meetings for mutual benefit. Our membership has increased by 25 per cent above those enrolled in April, 1949, (almost 300 new members). We have fostered establishment and affiliation of four new chapters. We have presented out of committee the *Minimum Standard For Pharmacies In Hospitals* and have obtained approval by several organizations to date. We have prepared *Minimum Standards For Pharmacy Internships in Hospitals* and have gotten these out of committee. We prepared an interesting program for the annual convention and for several hospital pharmacy institutes and other meetings. We almost completed a syllabus for a course in hospital pharmacy administration and leave the completion of this project plus several other educational projects for further committee activity. We have revised our constitution and by-laws to include rules for the newly created House of Delegates. We have reviewed many hundred narcotic forms from hospitals and have made recommendation on an ideal form, for a future committee to present to the Commissioner of Narcotics for endorsement. We have cooperated with the American Hospital Association's Committee on Pharmacy in an effort to clarify narcotic regulations for hospitals. We have surveyed the several State Boards of Pharmacy regarding regulations pertaining to pharmacy service in the hospital. We have attempted standardization of parenteral solution containers and the preparation of plans for a container, the rights to which are to be the property of our Society. We have witnessed the birth of a new face and style to our BULLETIN OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS and I am certain we agree that it is one of the best professional pharmaceutical journals available, and of course it continues to be the only one directed exclusively to hospital pharmacists. We have seen the appointment of a hospital pharmacist as director of the Division of Hospital Pharmacy. We have planned a service for hospital administrators, of consultation with them on hospital pharmacy problems, this service to operate on a nation-wide basis. There are several other things we have accomplished this year and in the over-all picture we have not done too badly. Much thanks and credit is due to our committee chairmen and members for continued plugging at their several assigned projects.

I believe that much of this progress was dependent on the forward-thinking and years-ahead-planning of a small group of our membership, coupled with the cooperation of the majority of our membership. Without such continued teamwork, our cause will be lost. Here's to continued teamwork!

PURCHASING POWER

It has been estimated that the combined hospital pharmacies in this nation purchase about $10 million worth of drugs and supplies every month. It is a fact that the income from advertising in our BULLETIN helps to finance operation of the Division of Hospital Pharmacy. While there

is no direct correlation between those two statements, I think we should all realize that proper support of and cooperation with our advertisers will mean continued publication of the BULLETIN in its present form and will mean continued operation of the Division of Hospital Pharmacy, both for the improvement and benefit of hospital pharmacy practice.

CONSULTANT SERVICE

In previous issues, we have discussed the formation of a consultant service on hospital pharmacy. These plans have progressed to the point where an announcement of their activation will soon be made.

Don Francke in previous editorials has encouraged us all to offer our services as pharmacy consultants to administrators who are obtaining federal grants for expansion or for new construction. In previous years, I could not get our local group of hospital pharmacists interested in such a project, as a group. This past year as president, I thought I would try to offer such consultant service to hospitals in my area that I knew were expanding or that were under construction. I was amazed to note the response to my letters from these hospitals and find there is real interest evidenced by hospital administrators in this offer of consultation. At the moment I have an offer to assist in furnishing and equipping the pharmacies in a newly-constructed hospital, and in a newly constructed outpatient department. There have also been letters of thanks for the offer of a consultant service with the statement that the hospital will avail itself of this opportunity in the near future, when detailed plans for the pharmacy are prepared.

If this can happen in the Philadelphia area, think of the great possibilities on a nation-wide basis, to provide a valuable contribution to hospital pharmacy practice. I wish that every affiliated chapter would assume an obligation to offer such assistance this coming year.

REGIONAL CHAPTER MEETINGS

The Texas Society of Hospital Pharmacists met with the Texas Hospital Association on March 7th at Galveston. President Lewis S. Smith and Secretary Adela Schneider were responsible for an interesting program and a good turnout. The annual meeting of our Texas Chapter will be held May 22 and 23, 1950, with the Seminar On Hospital Pharmacy held at the University of Texas. This progressive Texas group also plans another meeting for June with the convention of the Texas Pharmaceutical Association.

The Southeastern Society of Hospital Pharmacists met with the Southeastern Hospital Conference on April 6 and 7 at St. Petersburg, Florida. President Albert Lauve and Secretary Johnnie Crotwell reported a good program with excellent turnout. Tom Reamer, then president-elect, brought greetings from the Executive Committee and Society Membership.

Hospital pharmacists in Northeastern New York State met on March 18th in Albany to plan formation of a regional chapter. Through the determined efforts of Walter M. Hartmann, pharmacist, Ellis Hospital, Schenectady, and as a result of this meeting, at which Grover Bowles, vice president-elect, represented the Executive Committee, twenty-five new members are expected and the chapter formation is assured. Many thanks to Mr. Hartmann.

"BOOK-OF-THE-MONTH-CLUB"

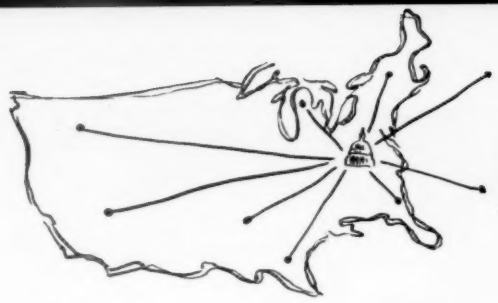
I have been in several hospital pharmacies where the only semblance of a library is the U.S.P., N.F., and the Red or Blue Book. A good information service for the medical and nursing staff is very important to the progressive pharmacist. To those whose libraries contain under 25 volumes, let me recommend you form your own "book-of-the-month-club." I feel certain that the administration will agree and that your budget will not be upset by ordering $5.00 or $10.00 worth of books each month, consistently year in and year out. Of course you should read these new volumes. In that way you will progress mentally, as will your ability to offer a competent information service. Thus you will be better able to serve your hospital.

FAREWELL

This is my last opportunity to use the presidential privilege of writing what I please and hoping you will read it. I trust the information has been of interest and of some value. I have derived great pleasure from the many hours spent on presidential matters and have benefited greatly by the opportunities presented to talk hospital pharmacy and to see hospital pharmacies in action throughout this great nation. I have been deeply honored by the opportunity to serve the Society as its president and I have honestly enjoyed almost every moment of this activity. It has been a pleasure to serve you.

Sincerely,

Herbert L. Flack



A.S.H.P. AFFILIATES

Sixty members of the **Northern California Society of Hospital Pharmacists** saw the educational picture "Normal Function of the Human Kidney" at the February meeting held at St. Mary's Hospital in San Francisco. Mr. Charles Holaday gave a report on the penicillin pricing survey underway for the past three months. Despite adverse newspaper publicity concerning penicillin pricing in hospitals, the survey showed that hospital prices are fairly uniform and as reasonable or more so than retail stores. Some hospitals showed a higher price when the price included the cost of injection. Some prices were less than cost showing improper accounting. Returns from the Seattle Hospital Pharmacists showed their prices to be in line with ours.

Six new members were welcomed into the organization and several students from the University of California College of Pharmacy were visitors. It was announced that the Northern California Society would participate in a lecture program to hospital administrators in connection with the Hospital Survey and Construction Program.

Announcement was also made concerning plans being made to make a contribution to the Julian Wells Memorial Scholarship Loan Fund.

The March meeting of the Northern California Society was held at the Veterans Administration Hospital in Oakland with 42 members present. A lecture was presented on "Higher Estrogen Syndrome" by Morton Meyer, M.D., Consultant in Medicine at the Veterans Administration Hospital, Fort Miley.

Mr. Jerome Yalon, Chief Pharmacist at the University of California Hospital, was elected delegate to the 1950 annual meeting to be held in Atlantic City, N.J., in April.

The Western Pennsylvania Society of Hospital Pharmacists met at St. Francis Hospital in Pittsburgh on February 16 with 26 members and guests present. An address was presented by a representative of the Blue Cross Hospital Insurance Plan followed by a discussion period. Those present were given an opportunity to visit the pharmacy department at St. Francis Hospital.

The March meeting of the Western Pennsylvania Society was held at the Falk Clinic at which time E. R. Squibb & Co. presented a film on prescriptions.

New officers elected to serve during the current year are as follows: President, Robert Statler, Veterans Hospital, Aspinwall; Vice-President, Sister M. Francine, St. Francis Hospital, Pittsburgh; Secretary, Josephine Certo, Columbia Hospital, Pittsburgh; and Treasurer, Dorothy Monyak, Children's Hospital, Pittsburgh.

The Greater New York Chapter of the American Society of Hospital Pharmacists met at Mary Immaculate Hospital on January 18 at 2:30 P.M.

The "Future of Antibiotics" was the subject of discussion at this meeting. Dr. Journa of Lederle Laboratories, the guest speaker, discussed the recent trends and progress in the introduction and development of such substances as the sulfa drugs, penicillin, streptomycin, bacitracin, Chloromycetin, neomycin and aureomycin, as well as such products as thiouracil, propylthiouracil, folic acid and vitamin B_{12}. Information of interest to the pharmacist concerning the chemistry, pharmacology, experimental and clinical investigation, action and uses was reviewed in the course of the discussion. In summarizing the possibilities of antibiotics, Dr. Journa predicted the discovery of extremely useful knowledge regarding these substances in the near future.

The February 15 meeting of the Greater New York Chapter was held at the New York Foundling Hospital. In accordance with the schedule for this session, a discussion on narcotics was presented by Mr. Casterrella of the Bureau of Narcotics, Treaury Department. Beginning with the history of narcotic control up to the present time, Mr. Casterrella explained the laws and regulations governing the use and dispensing of narcotics, with particular reference to those which refer to hospitals. As an additional feature of the discussion, an exhibit was presented portraying the types of narcotics and manner employed in addiction, as well as disastrous effects resulting from the habitual use of said drugs. A question and answer period followed which brought a number of enlightening facts with emphasis on accurate narcotic records and inventories, and cooperation with the Treasury Department in enforcing narcotic laws.

Officers of the **Society of Hospital Pharmacists of Greater Cincinnati** elected to serve during 1950

include: Chairman, Mr. Irwin Weinberg, Cincinnati General Hospital; Vice-Chairman, Mr. Eugene Trainor, Cincinnati General Hospital; Secretary, Mrs. Christine Reinhardt, Bethesda Hospital; and Treasurer, Mr. Marion Wesler, Bethesda Hospital. The new officers were honored at a dinner meeting at the Hotel Alms on January 11. On making plans for the new year, the new president outlined the program and made committee appointments.

Plans are going forward toward organizing a student training lecture series at the Cincinnati College of Pharmacy with members of the hospital pharmacists' group participating.

Preliminary plans were made to conduct a general price survey of hospital medications and Miss Mary Mori was appointed to take charge of this.

New officers of the **Ohio Society of Hospital Pharmacists** to serve during the coming year include: President, William Slabodnick, Massillon City Hospital, Massillon, Ohio; President-elect and Program Chairman, Basil Valenti, Fairview Park Hospital, Cleveland, Ohio; Corresponding Secretary, Charlotte Cox, University Hospitals, Cleveland, Ohio; Recording Secretary, W. H. McElroy, Peoples Hospital, Akron, Ohio; Treasurer, Mary Morgan, Childrens Hospital, Akron, Ohio. The Ohio Society met in conjunction with the Ohio Hospital Association in Columbus on March 23 and 24.

The Illinois Chapter of the American Society of Hospital Pharmacists heard Dr. Andrew C. Ivy, vice-president of the University of Illinois, discuss "Progress in Medicine" at the March meeting. Dr. Ivy, an internationally known scientist in medicine and pharmacology, discussed future trends in medicine and therapeutics.

President Larry Pesa of the **New Jersey Society of Hospital Pharmacists** outlined the program for the current year at the January meeting. Accordingly, an educational program is planned with each member participating. At each monthly meeting a member will present a 30 minute report on the different departments of the hospital such as Nursing, Outpatient, Record Room, etc.

The New Jersey Society is also working on a project in which a list of hospitals in New Jersey is being compiled along with the name of the pharmacist in each. An exhibit showing hospitals having a pharmacist has been prepared and has been shown at the Rutgers University College of Pharmacy with the purpose of introducing the seniors and recent graduates to hospital pharmacy. Plans are also being made to hold a meeting in May with the Southern New Jersey hospital pharmacists.

Reading from left to right—Mrs. Anna Richards, Mountainside Hosp., Montclair; Mr. Rudolph Wilhelm, St. Michael's Hosp., Newark; Miss Eve Weiss, Lutheran Memorial Hosp., Newark; Mrs. Audrey Schilke, Englewood Hosp., Englewood; Miss Mildred Avantario, Englewood Hosp., Englewood.
Standing on stairs—Mr. Paul Neilson, Medical Center, Jersey City,; Mr. Ludwig Pesa (President), St. Mary's Hosp., Passaic.
Right Hand Side—Mr. Gabriel Roberto, Hopedell Hosp., Preakness; Miss Jennie Cutler, Orange Memorial Hosp., Orange; Miss Samuels, Hackensack Hosp., Hackensack; Next woman is a guest non-member; Mr. Bruce Lach, Elizabeth General Hosp., Elizabeth; Mr. Bertram Jones, Essex County Hosp., Fairview Ave., Cedar Grove.

Mr. C. Joseph Vance, assistant administrator and chief pharmacist at South Highland Infirmary in Birmingham, Ala., has been elected president of **The Southeastern Society of Hospital Pharmacists.** Mr. Vance has been active in the Southeastern Society since its organization and he is presently president of the Birmingham Hospital Council. He is an editor of the Hospital Pharmacy Section in *Southern Hospitals* and has contributed many articles to hospital publications. Other officers recently elected include Mr. Earnest W. Rollins, vice-president, who is chief pharmacist at North Carolina Baptist Hospital in Winston-Salem, N.C.; and Miss Johnnie Crotwell, secretary, who is chief pharmacist at Druid City Hospital in Tuscaloosa, Ala.

Thirty-four members were present at the March meeting of **The Southern California Chapter of the American Society of Hospital Pharmacists.** The program for the evening, arranged by Charles Hagan, program chairman, consisted of showing the picture "Kidney Function in Health," and a talk by Dr. Morton Mayer, head of the Urology Department of the Ross-Loos Clinic in Los Angeles. Dr. Mayer's subject was "Drugs Used in the Practice of Urology."

New members were introduced and Sister Junilla reported on her trip to Washington, D.C., to attend the Executive Committee meeting of the A.S.H.P. A report was given by Charles Hagan in regard to the proposed visit to Baxter

Laboratories which is scheduled for April 12.

Recipients of the scholarships given by the Southern California Chapter were introduced. They are Evangeline Browning and Kikuyo Munemori who are pharmacy interns taking the course in hospital pharmacy being given at the University of Southern California College of Pharmacy.

At the February meeting of **The Hospital Pharmacists Association of Greater St. Louis,** Professor Frank Mercer of the St. Louis College of Pharmacy, presented a discussion on Pharmacy Laws, including city, state, and federal. During the business session announcements were made in regard to A.S.H.P. membership activities, affiliation with the Missouri Pharmaceutical Association, the dates for the 1950 institutes on hospital pharmacy, acceptance of the Minimum Standard For Hospital Pharmacies, and the district meeting of the American Pharmaceutical Association to be held in St. Louis. Mr. Norman Hammelman read and discussed a number of abstracts from the *Journal of the American Medical Association.*

The Right Rev. Monsignor John W. Barret, president of the Catholic Hospital Association was honored at the November meeting of the **Midwest Association of Sister Pharmacists** held at the St. Joseph's Home for The Aged in Chicago. Luncheon was held in honor of the president on the occasion of his elevation to the Ecclesiastical Rank of Monsignor, in apprecation for his interest in the group.

Included also on the program was a discussion on the Pharmacology of Histamine and Histamine-like Drugs by Francis T. Maher, Ph.D., M.D., from the University of Illinois, followed by a panel discussion.

The January meeting of the Midwest Association of Sister Pharmacists was held at St. Elizabeth Hospital in Chicago with Sister Mary Hortensis as hostess. Following a tour of the Pharmacy Department, Mr. Charles Lanwermeyer, Abbott Laboratories, presented a talk on the Birth of a New Drug. During the business meeting a discussion on the use of the various types of narcotic records and the problems of hospital pharmacists was presented.

The Michigan Society of Hospital Pharmacists met at the Veterans Hospital in Dearborn on January 12. A lecture on *Para*-aminosalicylic Acid and its Use in Tubercular Treatment was presented by Dr. Wehrmacher of the Veterans Administration Hospital staff. He discussed its use, indications, and toxicity.

The following report was presented by Mr. Louis Lester, Chairman of the Minimum Standards Committee:

> After deliberate consideration, the Committee on Minimum Standards of the Michigan Society of Hospital Pharmacists approves in principle the standards established for Internships in Hospital Pharmacies. However, this committee would like to comment on several paragraphs of these Standards.
>
> FIRST, it wishes to recommend that these standards be reviewed every two years by the American Society of Hospital Pharmacists. The committee feels that this is necessary in order to develop and enlarge the scope of these rules.
>
> SECOND, it is recommended that hospitals attempting to establish internships for hospital pharmacy should be accredited by the American Society of Hospital Pharmacists.
>
> THIRD, realizing that much will be expected of early graduates of Hospital Pharmacy Internships, the committee wishes to recommend that intern rotation time in the Administration Department be increased at the expense of time spent in the Outpatient Prescription Laboratory.
>
> FOURTH, the committee wishes to re-emphasize that selection of interns is of paramount importance. That to take average or below average students is not progression and is actually a detriment to the profession.

Hospital pharmacists of the **Puget Sound Area** met at the U.S. Marine hospital on January 10. Subjects under discussion at the meeting were pharmacy's role in purchasing drugs and supplies for the hospital, led by Mrs. Dorothy Bradley of Pierce County Hospital, and the pricing of pharmaceuticals to inpatients and outpatients of the hospital. A tour of the hospital pharmacy of the Marine hospital was conducted by Mr. Bart Proper (U. of W. College of Pharmacy, B.S. '40 and M.S. '47) chief pharmacist, and pharmacist Miss Kitano.

NEWS ITEMS

Dr. W. Arthur Purdum to Receive Harvey A. K. Whitney Lecture Award

Dr. W. Arthur Purdum, chief pharmacist at Johns Hopkins Hospital, Baltimore, Maryland, has been named recipient of the first Harvey A. K. Whitney Lecture Award sponsored by the Michigan Society of Hospital Pharmacists. This award, established in honor of the first chairman of the American Society of Hospital Pharmacists, is presented annually to the person who has made the most outstanding contribution to hospital pharmacy.

The selection of Dr. Purdum was made in recognition of his contributions during his term as president of the American Society of Hospital Pharmacists, his work as chairman of the Committee on Minimum Standards, for his initiative in establishing the first combined graduate-internship program in hospital pharmacy, and for his accomplishments as chief pharmacist at Johns Hopkins Hospital.

A testimonial dinner will be held in Detroit, Thursday, May 18th at 7 P.M. at the Detroit-Leland Hotel. Featured on the program will be a talk by Dr. Purdum who will discuss "Minimum Standards and the Future." Since this is the first year the award will be presented, the program will include special recognition of Mr. Harvey A. K. Whitney in honor of whom the award was established. In keeping with this spirit, several of Mr. Whitney's early associates in hospital pharmacy will attend the dinner and participate in the program. Included among these are Mr. I. Thomas Reamer, president-elect of the Society, Mrs. Evlyn Gray Scott, chief pharmacist at St. Luke's Hospital, Cleveland, and long an active worker in the Society, Dr. Edward Spease, who, with Robert Porter developed the first Minimum Standard for Pharmacies in Hospitals. It is expected that several other early associates of Mr. Whitney, including Donald A. Clarke and J. Solon Mordell, will be present also.

Reservations for the dinner may be secured by writing Miss Amelia Sroka, Secretary, Michigan Society of Hospital Pharmacists, University Hospital, Ann Arbor, Michigan. The price is $4.00.

Pharmacy Department Sponsors Exhibit

An exhibit entitled "The Team for Health" was sponsored by the Pharmacy Department of The City Hospital of Akron on March 17 and 18. Included also was a panel entitled "Pharmacy, One of Many Hospital Activities" which showed small cards detailing some of the production records of the pharmacy for the past year.

Each year the exhibit is sponsored by the Auxiliary of the Summit County Medical Association to promote public knowledge and understanding

of the various facilities that are striving to maintain and elevate the general health and welfare of the public. Mr. Russel Lovell is chief pharmacist at Akron City Hospital.

Grover Bowles Is Delegate

Grover C. Bowles, chief pharmacist at Strong Memorial Hospital in Rochester and vice-president-elect of the American Society of Hospital Pharmacists has been named delegate to the United States Pharmacopoeial Convention holding its decennial meeting in Washington, D.C. in May. Mr. Bowles is a delegate of the Rochester School of Medicine.

Hospital Pharmacy Course at the University of Southern California

The University of Southern California School of Pharmacy is again offering a course in hospital pharmacy during the spring semester with Mr. Charles G. Towne as instructor. The course is being presented at night school in order that pharmacists may take this opportunity to bring themselves up-to-date on hospital pharmacy organization, administration and functions.

Secretary to British Pharmacopoeia Commission to Visit United States

Dr. C. M. Hampshire, C.M.G., arrived in New York City from England on April 6 to attend several conferences. Dr. Hampshire is secretary to the British Pharmacopoeia Commission and has been responsible for the 1932 and 1948 editions of the British Pharmacopoeia. He is chairman of the Committee of the World Health Organization which is entrusted with the production

of the *International Pharmacopoeia* to be published this year. He is also Editor of the Pharmaceutical Society's *Journal of Pharmacy and Pharmacology*, the monthly research journal, which was first published as a quarterly periodical in 1927.

In the capacity of chairman he will be presiding at the meeting of the World Health Organization Committee for the Unification of Pharmacopoeias to be held in New York. He will also be addressing the U.S.P. Convention, the conference of the Colleges of Pharmacy, and the annual convention of the American Pharmaceutical Association. Afterwards Dr. Hampshire will go to Ottawa to meet the Canadian Committee on Pharmacopoeial Standards.

Chronic Barbituate Intoxication Film Available

The student body and faculty of the 1949 Institute on Hospital Pharmacy held in Chicago can probably still remember many aspects of the film which Dr. Harris Isbell, Director of Research, U.S.P.H.S., Lexington, Kentucky, showed as part of his discussion on "Drug Addiction Problems." After seeing the film at the Institute, many persons remarked that they would like to borrow it to show to their medical and nursing staff and also to their local pharmaceutical organization.

This film is now available for loan to interested organizations or persons. Present schedule for showing of the several copies allows no opportunity for scheduling before July 1950. Persons interested in booking the film for the summer, fall, or winter, should write to Dr. Harris Isbell, Director of Research, U. S. Public Health Service, Lexington, Ky., stating an approximate period during which they would like the loan of this film. There is no charge for use of the film.

The film entitled "Chronic Barbiturate Intoxication" is 16 mm. Kodachrome. It is about 440 feet and the running time is approximately 17 minutes. The film is silent. It is accompanied by a commentary which is read as the film is shown and the individual who is to read the commentary should preview the film prior to presentations.

Connecticut Society Applies for Affiliation

The Connecticut Society of Hospital Pharmacists has applied for affiliation with the American Society of Hospital Pharmacists. On making application, a list of 18 members has been submitted. Officers of the Connecticut Society are: President Thomas Heffernan, Waterbury Hospital, Waterbury; Vice-President Oswald Peck, Fairfield State Hospital, Newton; Secretary Shirley Bennet, Grace-New Haven Community Hospital, New Haven; and Treasurer Sister Maria Lucia, Hospital of St. Raphael, New Haven.

The annual meeting of the Connecticut Society was held at St. Joseph's Hospital in Stamford on April 1. Mother Sacred Hart, administrator of St. Joseph's Hospital welcomed the guests and members. The principal speaker, Dr. Foley, medical director of Winthrop Stearns, presented a concise and informative description of the germicidal effect and chemical properties of Zephiran.

Treasurers Meet

Three of the Society's Treasurers met at St. Mary's Hospital, Brooklyn on the occasion of Sister Junilla's recent visit to the East to attend the meeting of the Executive Committee. Left to right are: Sister Mary Junilla, O.S.F., present treasurer of the A.S.H.P. and chief pharmacist at Queen of Angels Hospital, Los Angeles; Sister Mary Etheldreda, past-treasurer and chief pharmacist at St. Mary's Hospital, Brooklyn and Sister Mary Jeanette, treasurer-elect and chief pharmacist at Mary Immaculate Hospital, Jamaica, Long Island.

Dr. Purdum Reappointed to N.F. Committee

Dr. W. Arthur Purdum, chief pharmacist at Johns Hopkins Hospital, has been reappointed as a member of the Committee on National Formulary. He has recently completed serving an unexpired term and is now appointed for a ten year period.

Glycerin Review Available

The Glycerin Producers Association is now offering for the first time a practical review, *Glycerin Applications in Drugs and Cosmetics.* This sixteen page booklet may be obtained free of charge by addressing the Glycerin Producers Association, Dept. DC 1, 295 Madison Ave., New York 17, N.Y.

POSITIONS IN HOSPITAL PHARMACY

POSITIONS OPEN

MASSACHUSETTS . . . Chief pharmacist wanted for 400 bed hospital in large New England city, especially one qualified to undertake reorganization program in the pharmacy. Excellent salary. State qualification of experience, internship, and educational background in letter addressed to Division of Hospital Pharmacy, 2215 Constitution Avenue, N.W., Washington, D.C.

PHARMACIST WANTED—Newly constructed 300 bed hospital offers excellent opportunity for two pharmacists, one as chief pharmacist and the other as assistant pharmacist. Location near Philadelphia, Pa. Address inquiries to Division of Hospital Pharmacy, 2215 Constitution Avenue, N.W., Washington, D.C.

The following openings in hospital pharmacy appeared in the March issue of *The Modern Hospital*, page 240. Anyone interested in the positions should write directly to the agency indicated. A fee is charged when positions are secured through the services of a personnel agency.

PHARMACISTS—(a) University hospital; in addition to compounding prescriptions and preparing solutions, duties include those of administrative nature; west. (b) To head department recently created, well established group, staff of fifteen specialists, middle west. (c) Chief; 300-bed general hospital; university town, south. (d) Two; large municipal hospital; east. MH 3-12—The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago, Ill.

PHARMACISTS—South; 300-bed fully approved hospital located in city of 200,000; excellent opportunity—Shay Medical Agency, Blanche L. Shay, Director, 55 E. Washington St., Chicago 2, Illinois.

The following openings in hospital pharmacy appeared in the April issue of *The Modern Hospital*, page 230.

PHARMACISTS—(a) Pharmacist qualified and willing to divide duties with those of purchasing agent; small general hospital; east. (b) Chief; 300-bed hospital; university town, south. (c) Chief; relatively new hospital, 350 beds; Rocky Mountain state. MH 4-12—The Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago, Ill.

PHARMACIST — Registered; New Jersey; $300, meals. Medical Personnel Exchange, Nellie A. Gealt, R.N., Director, 4707 Springfield Avenue, Philadelphia 43, Pa.

POSITIONS WANTED

INTERESTED IN PROGRESSIVE hospital pharmacy with particular interest in opening and organizing a pharmacy in a hospital that has no registered pharmacy at present. Have had 14 years experience as technical assistant in a registered hospital pharmacy. Experience includes manufacture of tablets, U.S.P and N.F. formulas and preparations, and formulary preparations; purchasing of drugs; manufacture of parenteral solutions; and the compounding and dispensing of inpatient and outpatient prescriptions. Graduating in June from the Philadelphia College of Pharmacy and Science, Philadelphia, Pa. For reference, write to Herbert Flack, chief pharmacist at Jefferson Medical Hospital in Philadelphia, Pa., and/or to J. Robert Cathcart, chief pharmacist at The Chester County Hospital, West Chester, Pa., and to the Philadelphia College of Pharmacy and Science. Thirty-four years of age and married. Please write to Donald T. Miller, 317 Boot Road, West Chester, Pa.

YOUNG MAN DESIRES POSITION in hospital pharmacy. Trained at the University Hospital, Ann Arbor, Mich. Registered pharmacist. Member of the American Society of Hospital Pharmacists and the American Pharmaceutical Association. Address inquiries to William F. Bertz, P.O. Box 272, Ann Arbor, Mich.

FIFTEEN JUNIOR STUDENTS, pharmacy majors, at the Philadelphia College of Pharmacy and Science have designated interest in a position in a hospital pharmacy for the summer months—June-September, 1950. Will accept work in the middle eastern states. Some will work for room and board; others must obtain a fair wage for their services. Majority are experienced in retail pharmacy. Contact H. L. Flack, Jefferson Medical College Hospital, Philadelphia, Pa., if you can use such a person.

MR. PETER BERZINS, a pharmacist who has recently come to the United States from Europe, is interested in a position as a helper in a hospital pharmacy. He wishes to work under a registered pharmacist in order to fulfill the requirements for registration in this country. Mr. Berzins has submitted the following qualifications:

Graduated by the University of Piga, Latvia on January 16, 1929 as master of pharmacy (Magister der Pharmacy). The studies program at the chemistry faculty, pharmaceutical section, was held there, including the scientific work at the University for 5½ years or 11 semesters.

From 1930 to 1944 when he was evacuated from Germany, he owned a pharmacy. After the war he worked with a pharmaceutical company at Stuttgart, Germany and later with the International Refugee Organization Headquarters as a pharmacist. He is highly recommended. Mr. Berzins may be contacted at 714 Cortelyou Road. Brooklyn, N.Y.

N E W M E M B E R S

April 1, 1950

ALABAMA
Sherwood, Richard R., 244 W. Border Drive, Spring Hill
ARIZONA
Carroll, Edwin W., VA, Tucson
CALIFORNIA
Dyer, Wilma, 2709 College, Berkeley (A)
Furukawa, Elsie S., 1216½ S. Catalina, Los Angeles 6
Menin, Albert A., 615 S. Westlake Ave., Los Angeles 5
Shasholin, Igor G., 427—16th Ave., San Francisco (A)
Thompson, Lt. R. L. (MSC) USN, USN Hospital, Oakland 14
Zimmerman, Daniel R., 1027 Chula Vista, Burlingame
Zuick, Earle G., 147 E. Maple, Stockton
CONNECTICUT
Adams, Margaret L., 62 Rockwood Ave., Ansonia (A)
DISTRICT OF COLUMBIA
Kull, Raymond C., 2805—26th St., N.E. (A)
FLORIDA
Ferguson, Dwight L., 1507—53rd St., South, St. Petersburg
Reinhardt, Alfred A., 2461 S.W. 25th St., Miami 33
Toribio, Mary, 2909—12th St., Tampa
ILLINOIS
Sister M. Cherubim Cukla, 602 Green St., Danville
Sister M. Pia Rogowski, 372 N. Broadway, Joliet
West, Harmon, 7645 Sheridan Road, Chicago
INDIANA
Hull, Mildred Elizabeth, 2517 Union St., Indianapolis
Sakas, Mildred Irene, 1820 N. Pennsylvania, Indianapolis
IOWA
Hoffman, Mrs. Allene Margaret, Woodward
Sister Mary Theophila Rechner, 1407 Independence, Waterloo
KENTUCKY
Farrell, William J., 732 W. Oak, Ludlow
Newman, Richard F., V.A. Hospital, Ft. Thomas
LOUISIANA
Fortenberry, James W., 803 Jordan, Shreveport (A)
MARYLAND
McKinley, James Daniel, Jr., 101 E. 33 St., Baltimore 18
MASSACHUSETTS
Cheetham, Mary E., 614 Bridge St., Lowell
Conlon, Mary Ellen, 9 S. Williams St., Bradford
Rokas, James P., 35 Whitney, Boston
Shapero, Rosalie, Pharmacy Dept., Beth Israel Hospital, Boston
MICHIGAN
Digby, Rex E., 2417 Mortenson, Berkley
Lewicki, Helen, 18920 Maine, Detroit
Liu, John K. C., 1313 E. Ann, Ann Arbor
Meyer, Norwood H., 249 Moross Rd., Grosse Pte Farms (A)
MINNESOTA
Charlson, Gloria J., Spring Park
MISSISSIPPI
Pierce, Clarence E., U.S. Veterans Hospital, Biloxi
NEBRASKA
Burke, Mark J., 2118 S. 34th St., Omaha
Dorsey, Mrs. Lillian, 2006 Locust St., Omaha
Pirruccello, Sebastian C., Creighton Univ. College Pharmacy, Omaha
Sister Mary Carlene OSF, 1145 South St., Lincoln
NEW JERSEY
Carlin, Mrs. Evelyn M., 355—15th Ave., Paterson
Sister Veronica Joseph Golden, St. Francis Hospital, Trenton
NEW YORK
Benishin, George, Box 60, Sunmount
Blier, Samuel, 557 E. 93rd St., Brooklyn 12
Fleischer, Howard Elmer, 973 Parker Blvd., Kenmore 17
Lunger, C. W., 10 W. 6th St., Dunkirk
NORTH DAKOTA
Hall, Ruth M., P.O. Box 983, Grand Forks
OHIO
Chosy, Irene M., 626 Clarendon S.W., Canton
Dowell, Virginia L., 1243 Warren Road, Lakewood 7
Hanley, Paul J., 12016 Mortimer Ave., Cleveland
Komadina, Daisy, Mercy Hospital, Springfield
Murphy, Pat, 1719 W. H. Taft Road, Cincinnati
Peer, Chana, 954 S. Ohio Ave., Columbus
Pully, Ruth, 521 W. Bancroft, Toledo (A)
Sister Mary Eva Dunn, 2213 Cherry, Toledo
OREGON
Porterfield, Edwin M., 1910 Monroe, Eugene
PENNSYLVANIA
D'Abruzzo, Mary C., 1601 Spring Garden St., Philadelphia 30
Gifford, Darrell L., 148 W. 36th St., Erie (A)
Klein, Benjamin, 5830 N. 12th, Philadelphia
Martin, Ruth Charlotte, 1010 S. 46, Philadelphia (A)
Matalavage, Adele R., 5824 N. 13th, Philadelphia
Nied, Edward C., 3510 Gerber Ave., Pittsburgh 12 (A)
Perkins, John J., 1341 W. 10th, Erie (A)
TENNESSEE
Greenberg, Albert, 1903 Highland Ave., Knoxville
TEXAS
Griffith, William E., 2303 W. Berry, Fort Worth 4 (A)
Hall, G. Arthur, Pharmacy, Seton Hospital, Austin
Mathison, Howard, McCulloch-Concho Hosp., Melvin
VIRGINIA
Pearlman, William, 7711 Restmere Rd., Norfolk
WASHINGTON
Larson, T. Elida, 9th & Jefferson, Seattle 4
Truedson, Miss Hildur, 428 2nd St., N.E., Puyallup (A)
WISCONSIN
Jenson, Earl M., 2522 W. Capitol Drive, Milwaukee
Sister M. Franka Schruefer, St. Joseph's Hosp, Marshfield
CUBA
Soto, Bertha, 6 No. 516 altos, Vedado, Habana (A)

This is Bristol Laboratories' first advertisement in the BULLETIN *and we are indeed happy to inform the members of the American Society of Hospital Pharmacists that our advertisements will appear regularly.*

This is a list of some of our penicillin products

Flo-Cillin "96" (the original 96-hour product)
Flo-Cillin "96" Fortified
Flo-Cillin Aqueous (suspension)
Pen-Aqua (dry vial for aqueous injection)
Cilloral (penicillin by teaspoon)
Penicillin Tablets Oral (50,000—100,000—250,000—500,000 units)
Penicillin Soluble Tablets (50,000—100,000 units)
Penicillin Troches (also with Benzocaine)
Jenettes (penicillin in chewing gum form)

This is a list of Bristol warehouses at your service—

ATLANTA, GEORGIA
66 Mangum Street, N.W.

CHICAGO, ILLINOIS
509 West Roosevelt Road

NEW YORK, N.Y.
25 West 15th Street

LOS ANGELES, CALIFORNIA
2438 Enterprise Street

SYRACUSE, N.Y.

Bristol Depot
69 South Main Street
SALT LAKE CITY, UTAH